

Servel Will Continue Making Commercials

(Concluded from Page 1, Column 5)

Manufacturers Association, was named president of Servel, however, observers were inclined to believe the Wenner-Gren interests had decided not to kill Servel electric refrigeration, after all. Mr. Ruthenburg, of course, is an electric refrigeration man.

During 1934 Servel Hermetic and Crusader household electric refrigerators have not been manufactured for sale through distributors. The Crusader line has been reserved for export sales exclusively, while the Hermetic line has been liquidated through the company's retail stores in New York, Chicago, Pittsburgh, Buffalo, St. Louis, and Cleveland.

Sales of Servel commercial refrigeration and air-conditioning equipment have been remarkably good this year, according to reports from these stores. And advices from the factory indicate that May and June were the biggest months of the company's commercial refrigeration history.

Late in the spring, however, the Pittsburgh, Cleveland, and St. Louis stores were closed. Their inventories and part of their sales personnel were transferred to the New York, Chicago, and Buffalo stores.

Slashed-price sales were conducted in all three places, with telling effect. Frigidaire, Kelvinator, and General Electric distributors and branches in those cities have been complaining that Servel activities in their territories this summer have made serious inroads into their own sales volume.

These company-store sales have given rise again to rumors that Servel was quitting the electric refrigeration field. On the front page of this issue, however, is printed a flat denial from Vice President F. E. Sellman that Servel commercial electric refrigeration and air conditioning will be abandoned.

Most recent information—which is neither confirmed nor denied by Servel executives—is that Chairman Wenner-Gren of the executive management has compromised with President Ruthenburg of the operating management on an agreement to continue distribution of Servel commercial electric refrigeration and air-conditioning equipment without sales expense.

Field and office merchandising staffs will be dropped, and all orders taken by mail. For a time, at least, the Buffalo and Chicago company stores will be continued. The New York store was closed prematurely by fire.

Henrici Installs Vilter Air Conditioner

CHICAGO—Henrici's restaurant on West Randolph St. here is installing a Vilter air-conditioning system. To cost about \$20,000, the system will cool the first and second floors of the restaurant, and will hold an indoor temperature which varies according to the prevailing outdoor temperature. Approximately a 15° temperature differential will be maintained between the outside and the inside.

Commonwealth Edison Earnings Improve

CHICAGO—Commonwealth Edison Co. reports that net income for May and the first five months of 1934 exceeded the corresponding periods of 1933.

For the first five months gross income reached \$31,813,000 against \$30,152,869 for the 1933 period. Net income for the 1934 period was \$3,664,274 against \$3,518,937 after allocation of year-end adjustments.

Promoting the 'Magic Dial' Line



A. B. Dicus of the Stewart-Warner advertising department shows one of the pieces of promotion exhibited at the distributors' convention.

Krackowizer Adds To Plant Space

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has been taken over for storage of finished products. The second floor has been prepared for the manufacture of unit coolers—a production line which is now in operation—and machines have been installed for building such parts as return bends which were previously made outside.

The third floor has been fitted up with a drafting room, an experimental tool room, a test room, and an insulated room in which different temperature and humidity conditions prevalent in various sections of the country will be produced for experimental work. Both drafting and tool rooms are to be air conditioned.

The other side of the third floor is being tooled for assembly of air-conditioning units. These will be of the commercial "store cooler" type of equipment, Mr. Krackowizer states, not for small air-conditioning coils.

He is now laying plans for a rear addition to the second and third floors of the building.

Leonard to Sponsor Fall Campaign

DETROIT—Leonard Refrigerator Co. is launching a country-wide sales campaign, largest ever used at this season of the year, to run until the middle of September, company officials announced last week.

The campaign will be built upon newspaper advertising, which was used extensively during the first nine months of Leonard's fiscal year when the company shipped more refrigerators than during any full fiscal year in its history. Its fiscal year ends Oct. 1.

"Although sales fell off slightly during June, July brought with it considerable improvement, and definite indication of a resumption of public purchasing which marked the spring months," officials said. "In the last nine months we shipped more refrigerators than in any full year in our history."

Dealers and salesmen will be awarded a total of \$30,000 in prize money in this late-summer drive, according to Sam C. Mitchell, advertising manager.

Michigan Dealers See New Radios

DETROIT — Approximately 400 dealers and salesmen from southern Michigan were guests at an "open house" held last week in the Statler hotel here by Morley Bros., Stewart-Warner distributor, for the purpose of showing the Stewart-Warner "all-wave" radio line and the electric refrigerator line.

Dealers and their salesmen inspected and listened to the 18 radios in the new line, looked over the refrigerators and inspected the electrically lighted "radio map of the world" which will be used as a display which will rotate among dealers in this territory.

Irving S. Leon, in charge of radio and refrigeration for Morley Bros. in Detroit, was host at the meeting, assisted by L. E. Buetow, Morley Bros. wholesale manager on radio and refrigeration in the Saginaw territory.

Stewart-Warner Corp. was represented by F. R. Cross, advertising manager; E. F. Morford, divisional radio manager; and H. A. D'Arcy, divisional refrigeration manager.

Chicago Faucet Builds Bubbler & Glass Filler

CHICAGO—The Chicago Faucet Co. is introducing a combination bubbler and glass filler for water coolers, with a single handle which operates a cam arrangement to divert the water either up through a bubbler or down through a glass-filler outlet, depending on the direction in which it is turned.

It is furnished with a round china bowl and a china or metal bubbler nozzle, or if desired with an oblong octagonal enameled iron bowl and an offset angle stream nozzle.

Sees No Evil



Frank Hiter, vice president and general sales manager of Stewart-Warner, used blinders to demonstrate the right attitude towards competition at the recent distributors' convention.

Stewart-Warner Nets \$540,260 in 6 Months

CHICAGO—For the six months ending June 30, Stewart-Warner Corp. and its subsidiaries showed a net income of \$540,260, after all charges, including a reserve for year-end adjustments.

**whether \$79.50
or the price of the largest commercial!**



PHONE TODAY THE
NEAREST C. I. T. OFFICE

Abilene-Akron-Albany-Altoona-Amarillo-Asheville
Atlanta - Augusta - Bakersfield - Baltimore - Bangor
Bay Shore - Beaumont - Beckley - Binghamton
Birmingham - Boise - Boston - Bridgeport - Bronx
Brooklyn - Buffalo - Butte - Camden - Cedar Rapids
Charleston - Charlotte - Chattanooga - Chicago
Cincinnati - Clarksburg - Cleveland - Columbia
Columbus - Cumberland - Dallas - Dayton - Denver
Des Moines - Detroit - El Paso - Erie - Florence - Fort
Wayne - Fort Worth - Fresno - Glens Falls - Greensboro
Greenville - Hagerstown - Harrisburg - Hartford
Hempstead - Hickory - Houston - Huntington, N.Y.
Huntington, W. Va. - Indianapolis - Jacksonville
Jamaica - Jamestown - Jersey City - Johnson City
Kansas City - Knoxville - Lexington - Lincoln - Little Rock
Los Angeles - Louisville - Manchester - Memphis
Miami - Milwaukee - Minneapolis - Montgomery
Montpelier - Mt. Vernon - Muncie - Nashville - Newark
Newburgh - New Haven - New Orleans - New York
Norfolk - Oklahoma City - Omaha - Orlando - Paducah
Paterson - Peoria - Perth Amboy - Philadelphia
Pittsburgh - Pittsfield - Portland, Me. - Portland, Ore.
Portsmouth - Poughkeepsie - Providence - Raleigh
Reading - Reno - Richmond - Roanoke - Rochester
Rome, Ga. - Sacramento - St. George - St. Louis
Salt Lake City - San Antonio - San Bernardino - San
Diego - San Francisco - San Jose - Scranton - Seattle
Shreveport - Spokane - Springfield, Mass.
Springfield, Ohio - Stockton - Syracuse - Tallahassee
Tampa - Toledo - Tucson - Tulsa - Utica - Washington
Watertown - Wheeling - White Plains - Wichita
Wilkes-Barre - Wilmington - Wilson - Youngstown

More than ever, customers are interested by the offer of deferred payment facilities. It reduces price resistance. It helps to visualize the economies new equipment will effect. It permits buying without depleting ready cash. It is a proven stimulus of profitable sales when safeguarded with C. I. T. Financing Service.

There is a C. I. T. office in your territory which will check credits, buy paper, make collections...look out for everything. Plan to use it. It will save you money and leave you free to concentrate on selling.

C. I. T. Plans cover approved types of mechanical refrigerators and water coolers, as well as electric ranges and air conditioning equipment. Successful dealers the country over are using C. I. T. Service.

C.I.T. CORPORATION

NEW YORK — CHICAGO — SAN FRANCISCO

Completely Functioning Local Finance Offices in the Principal Cities

A Unit of COMMERCIAL INVESTMENT TRUST CORPORATION—CAPITAL AND SURPLUS OVER \$70,000,000

Announcing The New 1935 KR RANCO THERMOSTAT

designed for
all household
Refrigerators

whether
conventional
or
chest style

The KR for 1935, a new and improved thermostat, is broader in its application than all other Ranco Thermostats.

The KR is specially designed to meet the requirements of any household refrigerator, whether it is the conventional type or the chest model.

THE AUTOMATIC RECLOSING CIRCUIT BREAKER COMPANY
1300-10 Indianola Avenue, Columbus, Ohio

REFRIGERATION NEWS

Registered U. S. Patent Office

ESTABLISHED 1926. MEMBER AUDIT BUREAU OF CIRCULATIONS. MEMBER ASSOCIATED BUSINESS PAPERS. MEMBER PERIODICAL PUBLISHERS INSTITUTE.

ISSUED EVERY WEEK
VOL. 12, No. 17, SERIAL No. 283Copyright, 1934, by
Business News Pub. Co.

DETROIT, MICHIGAN, AUGUST 22, 1934

Entered as second-class
matter Aug. 1, 1927THREE DOLLARS PER YEAR
TEN CENTS PER COPY**Dry-Zero Sells
Insulation for
333,591 Boxes****Large Increase in Volume
Shown During First
Six Months**

CHICAGO—Pliable slab insulation for 333,591 household refrigerators was shipped by Dry-Zero Corp. during the first six months of this year. This is equivalent to insulation for 47 per cent of the 707,623 refrigerators reported manufactured by Nema members during this period, according to Harvey Lindsay, Dry-Zero president.

During the first half of this year, Dry-Zero shipments were two and three-fourths times those made during the first six months of 1933. Increased production by manufacturers who used Dry-Zero last year, plus orders from new customers or those who used only a small quantity in 1933, are responsible for this increase in volume, says Mr. Lindsay. Increase in dollar volume, however, has been considerably below the gain in shipments.

Shipments of Dry-Zero blanket and Sealpad insulation for refrigerated trucks are far above last year. During the first six months of 1934, shipments of these products were almost twice those in the same period of 1933.

**Restrained from Listing
'Frigidaire Service'
In Telephone Book**

TULSA, Okla.—W. C. Dance, Inc., Frigidaire distributor here, has been given an injunction by circuit court restraining the Southwestern Bell Telephone Co. and W. R. Chilton and Lucy Chilton, doing business under the name "Electric Refrigeration Service Co.," from listing the name "Frigidaire Service Agency" in the telephone directories and from using the name in connection with the Chilton Service operation.

The injunction is similar to and follows other cases filed by Frigidaire Corp. against Carl F. Geiger and Lance Wikkerink in which the court at Dayton restrained Mr. Geiger from using the name "Frigidation Service," and the court at Milwaukee temporarily restrained Wikkerink from the use of the name "Frigidaire Service Headquarters."

**Sloan Says Air Conditioning
Will Help Lead Recovery**

AMERICA is not in the doldrums to stay, nor must its people depend upon artificial economic adjustments to restore prosperity, for now taking root in the country's business structure are three robust young industries which will give rise to a period of good times unlike any this country has ever before experienced.

Those three industries are air conditioning, fabricated houses, and aerodynamic railroad equipment, and their growth will shortly disprove the contentions of pessimists that the country has gone the limit and cannot survive its present stalemate—so writes Alfred P. Sloan, Jr., General Motors president, in the current issue of *Atlantic Monthly*.

As a means of emphasizing the great progress industry can make in a comparatively short time, Mr. Sloan says, "This year at the reopening of A Century of Progress Exposition in Chicago it was said that more than half of the commercial exhibits represented lines of work new since the previous World's Fair of 1893."

"More than half of the persons on the grounds drew their incomes from industries not even in existence 40 years before, chief among them being the automobile, aviation, motion pictures, artificial-fiber industries, and a broad range of activities based upon alloy steels, synthetic resins, and improvements in the use of oil, coal, and electricity."

Mentioning how business methods have been improved recently, and the cause of labor strengthened, he goes on to say that labor stands to lose, however, if our recovery program continues to treat material progress as

**Westinghouse Co.
Adds 5-Cu. Ft.
Unit to Line**

MANSFIELD—Bridging the price gap between its standard 45 and 55 models, Westinghouse Electric & Mfg. Co. here is introducing a 5.2-cu. ft. refrigerator known as model CL-53. Its price in the first zone (Detroit area) is \$169.50 installed. The installed price of the 45 in that zone is \$167.50, of the 55, \$194.50.

The new refrigerator is finished in Dulux with a porcelain interior. Its shelf area is 10.5 sq. ft. and it makes 80 ice cubes at one freezing. Its height is 57 15/16 in., width 27 3/4 in., and depth 24 3/4 in.

**Automatic Designs
Refrigerant Valve**

MILWAUKEE—Automatic Products Co. has just designed a new refrigerant control valve, to be known as type 70-N. One of its most important applications is for the control of refrigerant in evaporators of commercial systems with several low sides connected to one condensing unit.

It is also suitable for air-conditioning installations where several cooling cabinets are served by a single condensing unit. In multiple installations such as these, additional evaporators may be installed without affecting the existing equipment.

The new valve can be used on evaporators up to about 15 tons of refrigeration on Freon and sulphur dioxide systems, and up to approximately 35 tons on methyl chloride.

A constant flow of current keeps the valve open. When this circuit is broken, the valve drops closed.

The valve uses the by-pass principle for opening a main valve. When the solenoid (see Fig. 1) is energized, it raises the plunger which is not attached directly to the valve stem.

**Cleveland Ice Firm Plans
To Make Refrigerators**

CLEVELAND—City Ice & Fuel Co. is preparing to manufacture its own refrigerators and air-cooling equipment, and has organized the Ice Cooling Appliance Corp. as the manufacturing unit, according to reports. Properties of the Rich Illinois Refrigerator Co. at Morrison, Ill., have been purchased for \$100,000, the reports say.

ended, to divide work as if there would never be any more than there is at present. This would mean stabilizing the standard of living on a reduced basis.

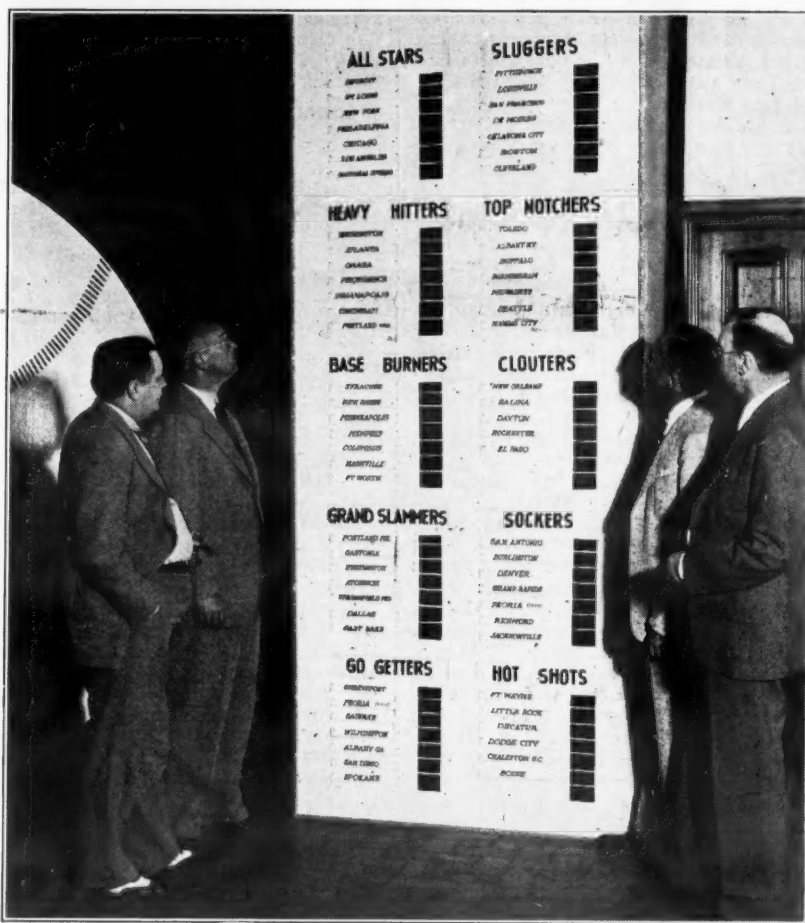
As to what Tomorrow's house will be like, Mr. Sloan writes, "The house will be air conditioned, with all facilities for heating, cooling, humidifying, drying, and washing the air its inhabitants breathe. It will have all modern conveniences for reducing housework, on a scale and of a variety not surpassed in the costliest mansions of the day."

"Its equipment will include special devices for bringing instruction and recreation into the home—the teletype for news dispatches, television apparatus to portray the world's great events as they occur, and radio sets embodying visual projection, so that motion pictures and operas can be brought directly to the view of the home circle."

"Just as the automobile buyer, by accepting a standardized product, gets for a few hundred dollars a car on which millions have been spent, so the house buyer, by accepting a standardized dwelling, will reap a tremendous price advantage through the pooling of costs under mass production. Also, the pre-fabricated house will be durable and fire-proof, with decreased charges for upkeep and insurance."

The industrialist says frankly that the fabricated housing industry will not spring into full growth in a twinkling. It will require years for that. Not so with air conditioning, for it is gaining momentum rapidly—it does not have to wait for wide acceptance.

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Leonard's Big League

President G. W. Mason, Vice President H. W. Burritt, Sales Manager Godfrey Strelinger, and Vice President H. G. Perkins gather around the "scoreboard" that shows the progress of their "Play Ball" contest.

**Potter Uses Egg as
Door Opener**

BUFFALO—In the popular slang of the day, to "lay an egg" means to fail miserably. But that isn't what Potter refrigerator salesmen mean when they say that they have just "laid an egg." For, by the simple means of leaving an egg in a prospect's refrigerator, they have enabled themselves to make a return appointment at that home.

Each refrigerator salesman working for A. R. Weber, Inc., Buffalo distributor for Potter Air-Conditioned Refrigerators, starts out in the morning with a half a dozen or more eggs. He carries them with him when he begins his cold canvassing.

After the housewife has answered his knock or ring, he proffers the egg, and asks:

"Madam, may I put this egg in your refrigerator?"

Almost invariably, these Buffalo salesmen report, she will assent. Whereupon the salesman walks into the house, goes to the refrigerator, breaks the egg into a saucer, and puts it into the refrigerator.

At this point, if not before, the housewife's curiosity gets the better of her. "What's it all about?" she wants to know.

But the salesman does not disclose his purpose. He politely leaves his prospect's curiosity whetted, merely asking if he may come back the next day to look at the egg. And he usually gets an appointment.

Next day he shows her how the yolk of the egg has collapsed, hardened, become encrusted, or otherwise deteriorated during its 24-hour sojourn in her refrigerator. Then he produces photographs of eggs kept 48 hours in a Potter refrigerator without signs of change. And by then he is well into the story of Potter refrigeration.

**Cortelyou Chairman of
A.S.A. Advisory Group**

NEW YORK CITY—George B. Cortelyou, head of the Consolidated Gas Co. and former president of Edison Electric Institute, has been elected chairman of the advisory committee of the American Standards Association. Other members are:

Sewell L. Avery, Montgomery Ward & Co.; Lamont du Pont, E. I. du Pont de Nemours & Co., Inc.; Walter B. Gifford, American Telephone & Telegraph Co.; Henry I. Harriman, U. S. Chamber of Commerce; W. A. Irving, U. S. Steel Corp.; James H. McGraw, McGraw-Hill Publishing Co.; Gerard Swope, General Electric Co.; Daniel Willard, Baltimore & Ohio Railroad.

**G-E Distributors Meeting
In Cleveland**

CLEVELAND—General Electric distributors gathered yesterday (Aug. 21) at Nela Park here for their annual fall convention, Camp Specialty Appliance VIII, which will extend through Aug. 24. Guests at the meetings are winners in G-E's All Star Discovery Drive, sales contest held last spring.

Headquarters for the distributors are at Cleveland's Wade Park Manor, while the guests, who will take part in several performances of model selling, are living in tents at Nela Park.

**Nema to Meet Oct. 17-20
In Chicago**

NEW YORK CITY—Annual meeting of the National Electrical Manufacturers Association will be held Oct. 17, 18, 19, and 20 at the Palmer House in Chicago.

**TVA Issues Brochure Promoting
Sale of Electrical Appliances**

CHATTANOOGA, Tenn.—Prepared for the dual purpose of explaining to Tennessee Valley folk the significance and aims of the TVA program, and promoting sale of electrical appliances in that area, a word-and-picture brochure has just been issued by the Electric Home & Farm Authority. It is among the first of a series to be published.

First page shows Franklin D. Roosevelt signing the act authorizing operation of the TVA, captioned by excerpts from the President's message to Congress in which he asked legislation for the Authority. Then follows an airplane view of the Norris Dam site, with typical Valley country around it.

Pictures of Wilson Dam at Muscle Shoals, and construction scenes at the General Joe Wheeler Dam and Norris Dam are shown to give some idea of the enormity of the Authority's power projects. They are headed, "This is how man is using the opportunity for cheap power which nature gave him." Succeeding photos illustrate the wide variety of uses, commercial and domestic, to which cheap TVA power can be advantageously put.

Titled, "Generating and distributing electric power is a public business—power policy of the Tennessee Valley Authority," there appears a double-page map showing important Tennes-

**Potter Secures
Jewett Factory,
Name, Business****Refrigerators Will Be
Assembled in Newly
Acquired Plant**

BUFFALO—T. Irving Potter has purchased the name and the business, "the good will and the traditions," and the factory on Letchworth Ave., Buffalo, of the Jewett Refrigerator Co. He will take possession of the plant and its equipment March 1, 1935.

Although he will continue to purchase machines from Universal Cooler Corp. and cabinets from Rex Mfg. Co., Mr. Potter will now have his refrigerators assembled in the former Jewett plant in Buffalo. Previously they have been assembled in the Universal Cooler plant in Detroit.

Jewett dates back to 1849 as a going concern. During its 85 years it has become best known as a manufacturer of custom-built refrigerators for fine homes. In recent years Jewett has been manufacturing electric refrigerators (using both Kellogg compressors and machines of its own make); never becoming, however, much of a factor in the business.

Edgar B. Jewett, present head of the Jewett Refrigerator Co., plans to continue making custom-built refrigerators in his pottery plant in South Buffalo.

**TVA Cannot Sell
Power to Atlanta**

ATLANTA—Indications are that this city will not be permitted to buy TVA power for its residents in the near future. Following the mayor's approval of the recent council resolution to obtain power from government sources, Assistant City Attorney J. C. Savage—who was appointed to investigate the plan's feasibility—was informed by David E. Lillenthal, power director of the TVA, that TVA's contract with Commonwealth Southern Corp. prohibits making any contracts in the Commonwealth territory for two years except in Knoxville. Atlanta can probably buy TVA power then if it so desires.

**Wabash Line Operates
Conditioned Cars**

DETROIT—All cars on day trains now being operated by the Wabash line between Detroit and Chicago are air conditioned, as is the dining-lounge car of the night train between Detroit and St. Louis.

see Valley cities, proposed and present dams, mineral deposits, and TVA transmission lines.

Pointing out that in its present state, the Tennessee River is a constant flood peril to towns along its banks, the text goes on to say that "moving water of a river is power and needs only the control of dams and storage reservoirs to be transformed as electricity into our greatest natural resource."

"A single reservoir cannot prevent floods nor a single dam produce the cheapest electricity. Many dams and reservoirs are needed. In times of high-water the reservoirs are fattened. As the rains cease, the water is released and, dam by dam, stepped down the valley. With each step the water is transformed into electricity, and, with each step, electricity is cheaper. Perfect river control allows no floods and not a single gallon to reach the sea without passing through turbines."

Then comes a description of dams now under construction and already built and others which are proposed to complete the control chain. The book continues, "Manufacturing will benefit from the cheap power produced from the fully controlled river. Cheap power in large quantities will turn . . . minerals in the region to man's use."

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Air Conditioning to Aid Recovery - Sloan

(Concluded from Page 1, Column 2)
ance of the new houses. It is adaptable for use in the homes of today. It has a head start.

After citing the tremendous steps which will be taken by the railroad industry in the building of new equipment for its lines, Mr. Sloan takes up the subject of the country's economic problems, and says in part:

"Unless capital and labor can agree on a reasonable division of the profits on their partnership, unless government can protect the property which is the residuum of initiative and thrift, then it may be difficult indeed to bring to fruition within our time the promised blessings which appear to be in the offing.

"I have no crystal-clear idea how the discordances of the moment may be solved; but I believe they will be solved when men of good intent comprehend that by quarreling over trifles they are delaying the day when all men can have more than they have today for their use, comfort, and security.

"Between an industry and its workers there is a natural community of interest. Both must draw their income from the sale of the goods or services produced; both must lose if sales fade away, as happens when products drop in quality or prestige, or when their products are overpriced as regards competing goods.

"The area of possible dispute between management and workers is always far smaller than the area of profitable concord. Under various employee-representation plans, government-mediation boards, and otherwise, a body of experience in industrial relations is being built up which may in time reduce friction in the labor field materially. The book of experi-

ment in economic relationships is no more closed than are the books of scientific research and business enterprise.

"Looking forward, either for a year or for a century, who can doubt the limitless ability of America to continue its industrial progress, provided men are left free to organize their activities? A new day is with us, and I would be the last to deny that it imposes new social obligations on employers; yet those obligations surely cannot be met by accepting any given situation as final, by retreating timidly toward the age of scarcity.

"Instead, I affirm the duty of industrial leaders to hasten this development, so pregnant with good for all mankind, not merely by originating and producing new goods and services, but also by putting their weight behind changes in the process of distribution, to the end that the material benefits so created may be more widely used."

B. T. U. Quota Club Membership Grows

DAYTON—Reports tallied Aug. 16 from 19 of Frigidaire's 44 districts show that, as of July 15, three times as many Frigidaire dealers, supervisors, and salesmen have qualified for the 1934 B. T. U. Quota Club as in the same period in 1933, Frank R. Pierce, sales manager, states.

Membership in the organization is achieved by accomplishing a sales quota based on personal ability, territory, and selling conditions.

Members who have sold their year's quota in six and a half months:

Akron district—George H. Elliott, John H. Shaver, and Frank M. Hewitt. Albany district—G. L. Hayes, J. Griffin, L. Couchot, and J. Ryan. Baltimore district—J. T. Watts and Moncure Noble. Chattanooga—Edward P. Nixon, H. H. Fennell, W. E. Atkinson, D. E. Davis, G. H. Scott, Milton E.

Hunter, Walter N. Jones, J. F. Campbell, Aubrey L. Jordan, George D. Aldrich, Alfred H. Tarr, Rupert A. Harwell, Harry H. Swink, Walter W. Cloud, J. H. Murrey, James P. Patton, Glenn O. Scott, Robert C. Lasseter, Thomas H. Newman, Lester C. Branson, W. R. Whitfield.

El Paso district—D. H. Patterson. Ft. Worth district—C. C. Lewallen, D. A. Davis, R. S. Cope. Houston district—Sam A. Fertitta. Kansas City district—Hiram D. Tenney. New England district—Thomas L. Roberts, H. O. Johnson, and G. F. Lodge. New Orleans district—Ralph H. Ferguson. Oakland district—R. F. Ryan. Pittsburgh district—George Grabbe, S. Harrison, Gimbel's department store, Lee Grimm, H. H. Powell, T. E. Faust, H. D. Jaffe, H. K. Thompson, R. B. Brooks, D. F. Zirkle, Aldo Marziale, E. R. Hooper, E. H. Kelley, H. R. Fetty, W. A. Durkin, Thomas Torch, and H. C. Grossman.

Salt Lake City district—Sam C. Hemphill, G. H. Detweiler, Detweiler Coal Co., Claude H. Detweiler. Seattle district—Kaufman Leonard Co., R. Erickson. St. Louis district—C. E. Wildberger, W. L. Bateman, Nick Crouch, J. M. Quinn, Harry A. Heineck, and Arthur H. Kaemmerer. Wichita district—Forest E. Link. New Jersey district—Michael A. Kaminisky. Norfolk district—C. H. Drummond. San Antonio district—Elbert Bain, D. H. Howell, and Ted Arnst.

Illinois Co. Creditors To Meet Aug. 25

STERLING, Ill.—Meeting of the creditors of the bankrupt Illinois Refrigerator Co. at Morrison, Ill., will be held Aug. 25 in the office of Referee Philip H. Ward here to consider the petition of the trustee to sell remaining office building property of the bankrupt estate. City Ice & Fuel Co. of St. Louis has already made a bid of \$3,000 for the property.

Shifting Population Trends Will Cause Changes in Sales Methods

WASHINGTON, D. C.—A shifting in population trends to the possible extent that the population of the United States may become stationary in another 10 or 15 years will necessitate a corresponding change in sales methods, it is pointed out in the July 21 *Kiplinger Washington Letter*, a new service circulated privately to business executives.

A new type of selling will be necessary, it is pointed out, because the ease of sales which come from ever-increasing population will be gone. On the other hand, "real wages" will increase and the individual standard of living will be higher.

Population Growth Slower

Text of the complete letter follows: "Here's the one big central fact: Formerly population was growing rapidly (more customers every year), and all business was geared to this. Now it is growing less rapidly, and the rate is going down from year to year, and many businesses are out of joint largely on this account. Within 10-15 years our population will cease growing and become almost static, and businesses must adjust to this new state.

"To get the right impersonal perspective, consider population as human live stock, and consider that all business is conducted to supply the needs of the human live stock, directly or indirectly.

Continued Decline Forecast

"Population growth in the past: Up to approximately the World War period, about 1,800,000 population was added annually in the U. S. Shortly after the war, around 1924, rate of increase began to decline. Now, in 1934, 10 years later, the annual increase is only 800,000. Population is 126,000,000, not the 150,000,000 anticipated 20 years ago.

"Population growth in the future: The rate of growth will continue to decline. Population will increase, but the increases from year to year will be progressively smaller. Some time between 1940 and 1950 (not far off), our population will cease to grow, will be stationary at some point around the 130,000,000 expected for 1940.

Due to Changing Standards

"Reasons for slower growth, and for the expected end of growth: (a) Immigration curtailment by new national policies, some 10 years ago. (b) Changing family standards by which children have come to be considered an economic liability rather than an economic asset, as in the old days, when children were productive earners on farms or in factories. Spread of birth control information is said by students of population to be result, not cause, of changing attitude toward children.

"Current facts indicating later stoppage of population growth: At present each woman (on the average) gives birth to less than one future mother—less than enough to reproduce the race and maintain it. Thus, 10 to 15 years hence, total population in U. S. may begin to decline, unless meanwhile there is unanticipated increase in birth rate. (In population studies, females count most; males don't count—much.)

Demand Will Fall

"Two important changes which go along with declining birth rate: (a) Quality of population declines, due to fact that birth rate has declined first and most among the more intelligent classes. (b) Proportion of adults increases. In 1920, about 40 per cent of people were under 20 years, and 20 per cent over 45 years. Forty years hence, 30 per cent will be under 20, and 35 per cent will be over 45.

"Do not confuse shift of population with growth of population. The two influences are closely related, however.

"Some of the long-range effects on business policies of population growth and shifts are suggested briefly in the following, with a minimum of involved explanations and fine points of exceptions:

"Staple commodities: Gradually slower growth of demand.

"Food: There will be less demand for staple foods, such as yield energy, due both to the cessation of growth of population, and to the older average age of people, and to diminution of physical labor. There will be in-

crease in demand for "fancy foods"—fruits, vegetables. Demand for milk will fall further because there will be fewer children.

"Goods used by the young: Demand will continue to fall.

"Goods used by the old: Increased demand for these. Also, tastes will become more conservative as average age of population rises.

More Leisure

"Leisure: Progressively more leisure, of course. Businesses depending directly or indirectly on people's leisure or play will grow.

"The young and the aged will work less, mainly because neither is as efficient in production as the middle-aged. The young, therefore, will be forced into longer periods of preparation—schooling or training of other sort. The aged will retire earlier and be supported in various ways, including old age pensions of one kind or another.

Conservatism Prophesied

"The middle-aged, with the aid of power and machinery, will supply adequately the material needs of the entire population.

"Business management will become more conservative. The "booster" spirit will decline because there will be fewer young executives.

"Living standards: Growth of business in the past has come from both normal increase in population and improving living standards. Hereafter business growth must depend more on higher living standards. These higher standards are expected as a matter of course, due to advance in invention and technical processes.

"But the ease of sales which come from ever-increasing population will be gone. Theoretically, when population is stationary, there is no potential customer to take the place of the customer you just sold.

Wages Will Mount

"Real wages' will increase in one way or another. Employers en masse will rediscover that the best way of combatting the effects of a stationary population is to increase consumer purchasing power, living standards, outlet for more stuff to the population we have.

"Demand for houses, and house furnishings, supplies, and services will be at peak during next 10 years because marriages will be at peak.

"Shifts of population will cause most large cities to shrink—generally bad for intra-city real estate and municipal bonds. City taxes probably will increase as cities lose population, taxpayers. Suburban property ought to be in continually greater demand. Industry will gradually decentralize to smaller cities, and many workers will have more than one job, more than one economic leg to stand on."

TVA Promotion Tells About Program

(Concluded from Page 1, Column 5)

"... New electro-chemical and electro-metallurgical processes require large blocks of power. Ranges, refrigerators, water heaters, and farm pumps also require electricity in larger quantities than have been customary. For volume utilization, electricity must be cheap. Public control over rivers will produce cheap electricity. 'Electricity for all' means enough electricity for all and for all uses—at a price the average man can pay."

How electricity for farm families "opens the door to modern life" is the next subject treated with text and numerous photos. Then come the pictorialized advantages of electric refrigeration as health protection, and the convenience of running water.

Final presentation in this piece of literature is a step-by-step explanation of what the EH&FA is, how it works, and how the Tennessee Valley can buy electrical appliances on the EH&FA plan.

In the brochure is a loose-leaf insert devoted to discussion of how the TVA program has operated in Tupelo, Miss., and showing that at rates now in effect there, an electric refrigerator, range, and water heater—all three—may be purchased through EH&FA for as low as \$6.98 per month.

The New 1935 KR

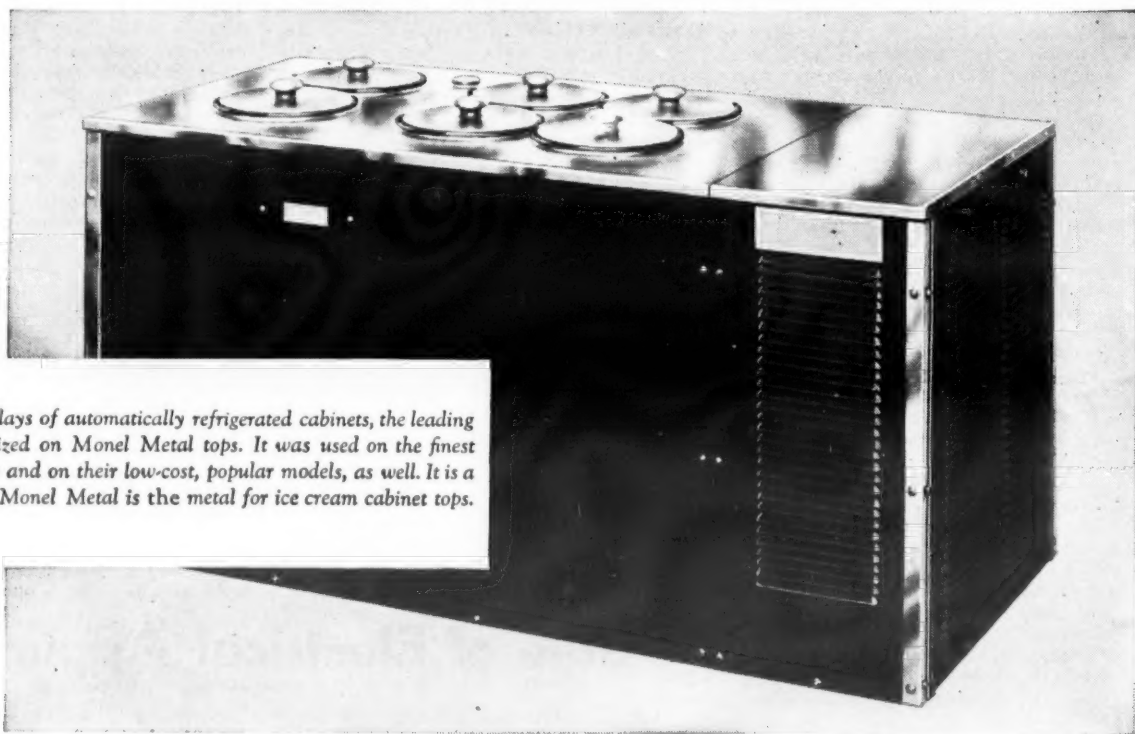
RANCO THERMOSTAT

- will be furnished in a number of new and improved models, ranging from the most simple temperature control to Semi-Automatic Fast Freeze and Semi-Automatic Defrost.

THE AUTOMATIC RECLOSING CIRCUIT BREAKER COMPANY
1300-10 Indianola Avenue, Columbus, Ohio

Cold Facts...

ABOUT ICE CREAM CABINETS



• Back in the early days of automatically refrigerated cabinets, the leading makers all standardized on Monel Metal tops. It was used on the finest models...as it still is and on their low-cost, popular models, as well. It is a recognized fact that Monel Metal is the metal for ice cream cabinet tops.

When Golden Oak went out, Monel Metal came in. And it remains the standard top material of all the leading makes...

HARK back to the days when ice-and-salt kept cabinets more or less cool. To the days when stops were burning up phone wires because their cream was melting in their old-type cabinets. To the days before mechanical refrigeration.

No ice cream manufacturer would willingly go back to those times. Credit the leading refrigeration builders for

the good job they did. And for their judgement in choosing the very finest possible material for cabinet tops... Monel Metal.

They standardize on Monel Metal because that tough, strong nickel alloy presents a remarkably handsome appearance and wears remarkably well. It never rusts. It resists corrosion. It is easy to clean and keep clean. And it

is a solid metal with no surface coating to chip, crack or wear off.

All good reasons, these, for the choice of Monel Metal cabinet tops. And equally good as reasons for replacements of tops that have taken a lot of punishment...tops that through abuse or neglect have grown battered and dingy.

A new Monel Metal top "dresses up" an old cabinet that has seen better days, and makes it once more the shining, handsome piece of equipment that it was years ago when first new. Write for details.

Monel Metal is a registered trade-mark applied to an alloy containing approximately two-thirds Nickel and one-third copper. Monel Metal is mined, smelted, refined, rolled and marketed solely by International Nickel.

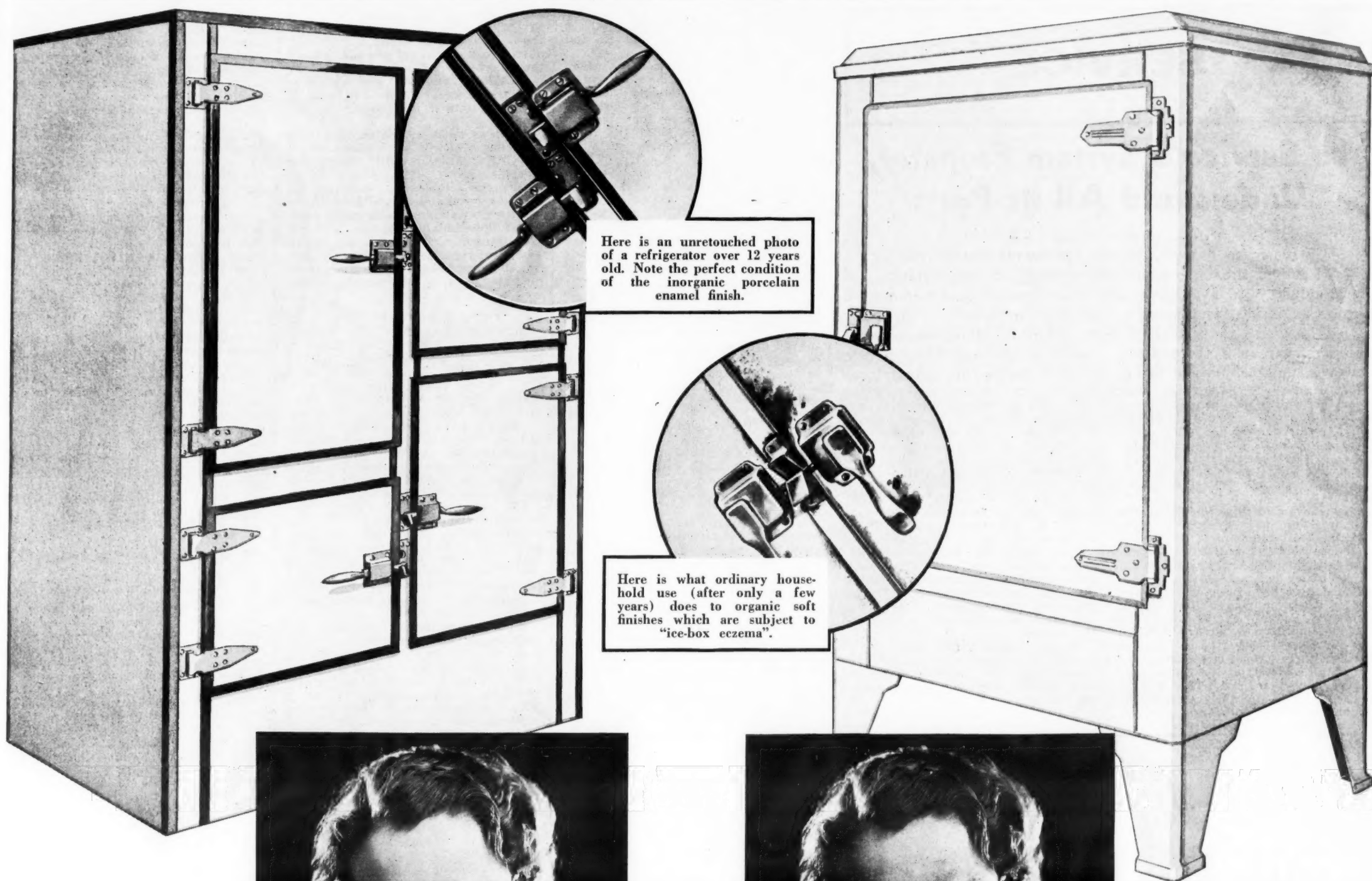
THE INTERNATIONAL NICKEL COMPANY, INC., 67 Wall St., New York, N. Y.



Monel Metal



See the INCO Exhibit of
MONEL METAL Household Appliances
at A Century of Progress, Chicago—1934
Home Planning Hall



Here is an unretouched photo of a refrigerator over 12 years old. Note the perfect condition of the inorganic porcelain enamel finish.

Here is what ordinary household use (after only a few years) does to organic soft finishes which are subject to "ice-box eczema".



Beauty must be **LASTING**

THE BEAUTY OF PORCELAIN ENAMEL IS PERMANENT

● Beauty may be only "skin-deep", but when the "skin" of a refrigerator begins to look as if it had eczema—then look for a customer with complaints.

The floor salesman who doesn't stress porcelain enamel's *lasting beauty* overlooks his biggest selling argument; misses his big chance to make a long-profit sale.

On the sales floor a soft-finish job *looks* much like a genuine porcelain enamel box. But what a difference after a little household use! The box with the ordinary organic finish may soon acquire a bad case of "ice-box eczema". And that takes all the joy and pride out of it. It looks haggard and old.

Organic finishes are subject to "ice-box eczema" as you can

readily prove by scratching them with finger nail, belt buckle, sauce pan or pencil point. A "live" cigarette will stain them. An ordinary rubber eraser will dull their lustre permanently.

But when you sell porcelain enamel you have sold life-time beauty. The smooth lustrous surface lasts a life-time because porcelain enamel is *inorganic*. It's flint hard. Your salesman can sell the better grades of refrigerators by telling the customer about the *lasting beauty* of porcelain enamel . . . And when they *do* they accomplish two things: they insure a satisfied customer—they ring up a longer profit.

Give your salesmen the selling facts contained in the booklet "What You Should Know About Porcelain Enamel". Send for a copy right now.



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PORCELAIN ENAMEL *THE Lifetime Finish*

Porcelain Enamel Institute, Inc.
612 N. Michigan Ave.
Chicago.

Send me a copy of your 24-page book: "What You Should Know About Porcelain Enamel". I'll have my salesmen read it so they can better sell the high-profit line.

Name

Address

Town and State

SERVICE

To Service a System Properly, Understand All Its Parts

By Arch Black

Refrigeration Engineer, Melchior, Armstrong, Dessau, Inc.

WHAT is the biggest service problem in the refrigeration industry today? Ask this question to any number of service engineers, and in all probability there will be so many varied answers, that if they were taken in all seriousness, it would appear as if the industry was doomed. On the contrary, however, most of us are rather proud to be in this industry, as the future looks promising and there seems no end to the progress being made in promoting new applications.

With the numerous applications there will always be service complications. It is these service complications with which we must necessarily concern ourselves. Where does the fault lie?

The answers to this would, like the first question, be very varied. Condemning the equipment is one of the most prevalent. Compressors, expansion valves, floats, controls, etc., would all be blamed.

True, there have been errors made, and it has been proven that certain equipment put into the field has been at fault, but if it is all boiled down, the real answer will often be found in the fact that the one condemning did not at all understand the functioning of the particular part. This will be particularly so in the case of the liquid metering devices and controls.

It is not the purpose at this time to go into complete details and explain in full the functioning of some or all of the various controls in common use.

However, an attempt will be made to point out where the average service engineer is wrong in blaming certain devices, when the fault really lies in the fact that it is due to lack of knowledge or carelessness.

Such items as float valves and pressurestats are more commonly understood as regards functioning, but the very well "known" thermo expansion valve appears to be one of the most misunderstood devices on the market.

Proof of this misunderstanding can readily be realized when it has been known that two purchasers of the same make expansion valve cannot get the same results.

One buys in large quantities and

gets expected results with a very low percentage of rejects. The other buys in lots of a dozen, and he expects, and does, return eleven.

This doesn't seem reasonable. Even the law of averages does not work out that way. Why should there be this tremendous difference? The only reason is that the one knows refrigeration and realizes what the functioning of the component parts is; the other does not.

There are three "famous" causes for a service call in the average service man's mind; (1) expansion valve adjustment, (2) air in the system and shortage of gas, (3) or too much gas. Yet even when he only has these three in his mind, frequently the remedy will be attempted where there is no cause.

Nine times out of 10 he will go straight to the expansion valve and make an adjustment, when the system is short of refrigerant. After making the adjustment, he does not get the desired results so the valve is condemned and another one installed.

After the new one is installed, he does not await results, but has decided the job is all right. (The customer is the one that suffers.) The job is eventually fixed by someone who knows, but the harm has been done; the customer is no longer so sure of electric refrigeration.

Study the Literature

Manufacturers are truly at the mercy of the service engineer, and it should be realized that these manufacturers are generally very pleased to have their products understood, and will cooperate and send literature where it is desired, and will answer questions concerning their respective products.

Of late there are many new comers into this servicing field, but the successful ones will be those who really understand and can visualize what is taking place in a system.

Don't jump to conclusions. Try to

diagnose the trouble intelligently, and the only way to do this is to survey the installation carefully. It is only guess work if gauges are not put on the machine. (Provided, of course, that it is understood what the gauge readings mean.) Again it is only a waste of time if the gauges are not accurate.

Learn as much as you can from the customer. He will often give you aid to a thought that will remedy his troubles.

To make a success in servicing, one must be on the alert and keep up to the times, watching trade papers etc. which give announcements and explanations of new valves and controls, and, of course, furthering one's education by experience. After the fundamentals have been learned, experience is the best tutor.

Two-Temperature Valves

By reading carefully the explanations of a given device, and then trying one out, a great deal of trouble is eliminated. Let us take a two-temperature valve. These are only designed within limitations. It isn't fair to expect it to do more than it is designed for. Instruction sheets are available, and give full details of the range and the differential. Is it the valve's fault if attempts are made to force the valve to operate outside of its range or differential?

Yet, when adjustments have been forced, and the valve returned to the factory, with a "never worked, and never will" attitude, the sender is very surprised when they receive word that this or that was broken or fractured, and the charge is so much, although the valve was not 24 hours on the installation.

Rough handling, or even a tap with a hammer or wrench can do the damage. Of course, it should be understood that at times the item is defective, but if so, the manufacturer is willing to repair free of charge.

This is knowledge for him, and he is always trying to better his products. Sometimes a service trouble can be traced to misapplication. When studying instructions, be sure that it be understood exactly where a given item be used, and if it is necessary to be in certain locations.

Take, as an instance, the literature on the G-W control. It states definitely that it be placed on the suction line near the evaporator outlet. Yet it is occasionally placed near the machine.

Yes, and it was condemned. It chattered or "did this or that," but certainly it did not work.

Much trouble arises in a system by foreign matter and moisture. Often through carelessness. Filters on any system are a good investment, and will usually prevent any trouble from dirt, etc. causing leaky needles. Where there is the slightest possible chance of moisture being in the system, don't take chances.

Use of Dehydrators

A dehydrator should be installed, and in large systems, two in parallel. While there are several drying agents for charging these dehydrators, one of the most commonly used is calcium chloride.

Some appreciate the advantages of a dehydrator, but again often expect it to go beyond its capabilities, particularly when calcium chloride is used as the drying agent.

Dehydrators charged with this agent should not be left on a system for a greater period than 24 hours, and certainly not over 48. True, there are many who do not adhere by this, and the answer is more trouble.

If you have not yet experienced the trouble, you can expect it at any time if you have a dehydrator charged with calcium chloride on a system over the above period. Should the foregoing remind you of one installed somewhere, you are strongly advised to remove it.

Again many valves have been condemned because they have failed to function by leaving such dehydrators on the line too long. Even after changing the valve on such instances, frequently no thought has been given to the cause.

The rest of the trouble stays in the system, and some think they have fixed the installation merely by the replacement valve, yet they have only prolonged the trouble.

In such a case, the valve is not at fault; the whole trouble being due to the fact that after a period, calcium chloride disintegrates and will gradually find its way through even a very fine mesh, and eventually cause clogging at the needle and seat of a valve.

The period of time for such a condition varies, but be safe and do not leave a calcium chloride dryer on a system over 24 hours. If not satisfied that all of the moisture has been removed, then recharge the dryer with a fresh charge.

Where calcium oxide is used as the medium for drying, this danger does not exist to the same extent. In apartment installations which are often opened for one trouble or another, it is very advisable to install a dehydrator and take no chances.

With systems where sulphur dioxide is the refrigerant, acid neutralizers are used to advantage where there is only a slight moisture content. These serve to neutralize any acid that has been formed from the moisture and forms sulphurous acid.

It is not necessary to leave them on a system over 24 hours. When they are removed, you may expect to find an increase in head pressure, due to non-condensing gases, which, of course, should be purged.

There are many valves, controls, and so-called "gadgets" offered to the field that will aid the service engineer in overcoming his problem, both in new installation and in old. Each one is worthy of consideration for its individual application, but first of all, try to understand its application and functioning.

Hints on Using Leak Detectors

By Engineers of Turner Brass Co.

THE refrigerant leak detector provides for positive detection and location of any leaks of chlorinated hydrocarbon refrigerants, including methyl chloride, F-12 or Freon, Carrene, ethyl chloride, methylene chloride, and others.

The majority of leaks are encountered by service men in the field, and as they are usually very small, it is imperative that the detector be kept at highest possible efficiency at all times. Following are a few hints which will aid the user in this respect:

Before starting on the job make certain the tank is from one-half to three-fourths full of clean, completely denatured alcohol, formula No. 5 being recommended as most satisfactory.

Never fill the tank with alcohol nor pump air pressure into the tank while in a room where refrigerant gas is present because doing so may cause the alcohol to absorb some portion of the gas with the result that the flame will burn green continuously and will interfere with the detecting process.

It is important that pressure in the tank should be kept low at all times. From four to six strokes of the pump will give sufficient pressure to operate the detector for an indefinite period, especially as the tank becomes heated from use and this tends to build up pressure without air being added by means of the pump.

Too high pressure will make the burner difficult to light and it also interferes with the delicate sense of detection.

The detector should be generated only by burning alcohol in the drip cup. Generating over a gas flame or with some form of preheating torch may actually destroy the metal in the burner or it may heat the burner head so hot that the wicking in the feed pipe becomes charred, with the result the flow of alcohol fuel is hampered.

The process of generation should be completed in a room without drafts and only in the presence of pure air, with no trace of leaking refrigerant.

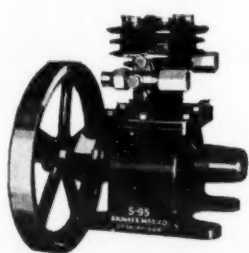
Normally the generated flame is almost transparent with a slight bluish tinge. As the open end of the tube is brought into proximity to a refrigerant gas leak the flame instantly turns green, the brightness of the green color becoming intensified in proportion to the rapidity of leakage.

The refrigerant gas is syphoned through the rubber tube into the burner chamber which is heated to approximately 1,200° F. This heat frees the chlorine in the refrigerant and when it comes into contact with the red hot copper baffle screw in the side of the burner tube, a copper chloride is created which causes the flame to change from blue to green.

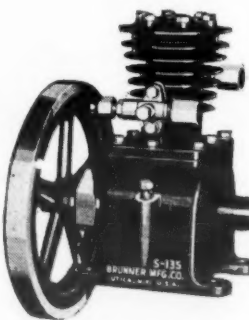
It is accordingly important that the copper set-screw be kept tight and in good condition. If it becomes burned to such an extent that the sensitivity of the detector is reduced, the screw should be replaced.

Equip Your 1935 Models with BRUNNER Compressors

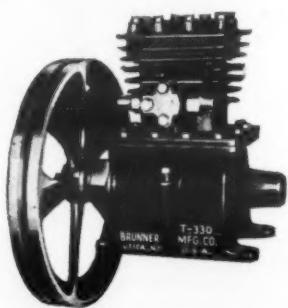
BRUNNER DEPENDABILITY WILL BUILD VOLUME AND PROFITS FOR YOU



Model S-95
1/6 H.P. Compressor



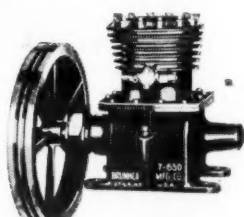
Model S-135
1/6—1/4 H.P. Compressor



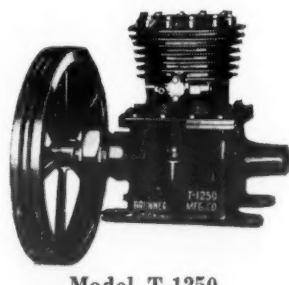
Model T-330
1/4—1/3—1/2 H.P. Compressor

Brunner, fastest growing name in the refrigeration industry, offers six dependable compressors to refrigerator manufacturers, each designed for a particular installation . . . all capable of rendering the type of service that builds satisfaction and goodwill for your product. Before you decide on your 1935 source of supply, it will pay you to investigate the Brunner line. A comparison of Brunner specifications and construction should convince you, you can get no greater value for your money.

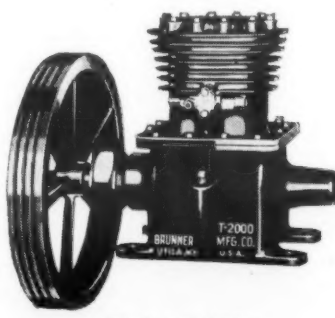
Twenty-eight years of compressor building stand behind every Brunner unit, the result of which is performance none can excel at economy few can equal. In short, you pay no premium for Brunner dependability. Mail coupon at once for illustrated Brunner catalog.



Model T-650
3/4—1 H.P. Compressor



Model T-1250
1—1 1/2 H.P. Compressor



Model T-2000
2—3 H.P. Compressor

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A Name Built by 28 Years of Service

BRUNNER MANUFACTURING CO.
UTICA, N. Y., U. S. A.

Send me your Refrigeration Catalog.

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Simple to Use

The Turner Halide Detector

Through a combination of basic laws of chemistry and physics it instantly locates the slightest leakage of ANY Chlorinated Hydrocarbon Refrigerant.

It is light to carry—simple to operate and positive in results.

The Turner Halide Detector has been approved by all leading refrigerator manufacturers for laboratory, production and field service purposes. Is in use by installers everywhere.

Your jobber can supply you or write direct for prices.

THE TURNER BRASS WORKS
Dept. N 8 Sycamore, Illinois

Lindsay Says Public Will Want To Know if Refrigerator Is Good

By Harvey Lindsay, President, Dry-Zero Corp.

WITH uncanny insight, the NRA Consumers' Advisory Board has put its finger on the fact that the purchaser of an ice box or electric refrigerator cannot discover whether the product he is buying is good or bad.

So far the Board has devoted itself to protecting the ice box buyer. Its efforts in this direction, however, should interest every electric refrigerator maker and dealer.

In its ice box report, the Board recommends that the consumer be protected by the establishment of rigid standards of construction and performance. A plate or label, to be attached to every ice box and carrying information the consumer should have, is suggested.

This, the Board feels, is desirable for the buyer's sake and for the benefit of honest manufacturers. The Board infers such a procedure would purge the industry of chiseling manufacturers who have preyed upon the public's inability to separate the sheep from the goats.

Dealers Favor Standards

A similar procedure for electric refrigerators was first suggested about three years ago. The plan was greeted coldly by most manufacturers. They resisted the idea of having their products graded under any sort of performance code. The scheme seemed foreign to normal business methods. Perhaps they suspected unseen dangers. Rather than conjure up new troubles, they chose to fight the ones they knew.

Dealers, on the other hand, favored the idea. About a year and a half ago, I conducted a survey of a representative cross section of dealers and found that 96 per cent of them favored the establishment of performance standards. All of them, seemingly, hoped the plan would furnish them with definite proof of intrinsic worth, something they felt the lack of.

Many Could Not Pass

I do not know the manufacturers' present attitude. No doubt they have been influenced, to a degree, by the growing agitation for merchandise standards of all sorts. The NRA Consumers' Board is the direct outgrowth of this trend. Perhaps there are a few manufacturers who would like to have the Consumers' Board make recommendations for the electric refrigerator similar to those made for the ice box.

Personally, I would dislike seeing this happen. They are too many electric refrigerators being built—many of them by honest, reputable manufacturers—which could not pass, with credit, any rigid test of long range economy.

I make this statement with considerable trepidation. Nevertheless, it is true. In some cases the manufacturers, themselves, do not know it. In other cases, they refuse to believe it, even when they are shown. If I had not seen the results of scores of tests on numerous makes of electric refrigerators, I would not believe it myself.

Test Long Range Efficiency

Here is how I know: About two years ago, the Dry-Zero laboratory developed a method of testing the long range efficiency of electric refrigerators. The method involves developing in two or three months the effect of several years of service in the warm, humid atmosphere of the average kitchen. These tests are synchronized with actual conditions so accurately that 1 or 10 years of service in any particular locality can be duplicated in the laboratory.

The result of these tests have been and continue to be astonishing. It is almost unbelievable that refrigerators of such widely varying value have been sold on an equal footing for so long. Varying 15 per cent to 20 per cent in efficiency when new, different makes vary 40 to 60 per cent in operating cost when age begins to creep upon them.

A.S.A. Tests Proposed

A good many manufacturers have profited by these performance and durability tests. Unfortunately, however, the Dry-Zero laboratory is a private enterprise, and some manufacturers seem afraid the tests are tinged with commercialism.

It is because of this reaction that I favor so heartily the development of similar test procedures and the establishment of performance standards by such organizations as the American Standards Association. Perhaps their tests will carry more weight with some of the manufacturers and convince them that, despite their honest efforts, their refrigerators are not what they believe them to be.

At the present time, the American Standards Association is completing work on a standard test code. To be helpful, these standards must be both rigid and comprehensive. If they are not, they will be detrimental to honest

manufacturers and beneficial to those that may not be above taking advantage of the public.

The industry, for its own benefit, must sooner or later face the point stressed by the Consumers' Board: that John Public cannot discover, by looking, listening, feeling, tasting, or smelling, whether the product he is buying is a durable refrigerator or a shining assembly of cheap substitutes.

A standardized performance and durability test code, it seems to me, should be blessed as the solution of a fundamental selling difficulty and not as a strait-jacket to banish healthful competitive merchandising.

Revenue Increase May Bring Reduction in Tupelo Rates

KNOXVILLE, Tenn.—First reports on results of low TVA rates and promotional activities of Electric Home and Farm Authority in Tupelo, Miss., and Athens, Ala., were characterized here recently as "highly satisfactory" by David E. Lillenthal, director in charge of power for TVA and president of EH&FA.

At the same time Mr. Lillenthal intimated that revenue results at Tupelo have promise of bringing even further domestic electric rate reductions for that city and a removal of the present surcharge on commercial and industrial rates within a year and a half.

As shown by Mr. Lillenthal's report,

in Tupelo the residential use in July, 1934, showed an increase of 16.2 per cent over June, 1934. July, 1934, showed a 75.4 per cent increase in residential use over February, 1934, which was the last month under old rates. Residential use in July, 1934, was 83.2 per cent over the same month in 1933.

In Athens, where TVA rates have been in effect for two months, the first month, June, showed a 22 per cent increase in residential use over May. In July residential consumption increased 16 per cent over June and for the period of June 18 to July 18 this year, the use was 48 per cent greater than for the same period in 1933.

"The Tupelo system is now in the black and creating a reserve over all expenses," the director stated. "I am satisfied from this showing that the Tupelo rates are now too high instead of too low, as was charged when we established them."

He said also that an industrial sur-

vey of northern Alabama shows that a substantial number of industries which had been closed because of losses are now opening because the difference in their new power rates is enough to make the difference between a profit and loss operation.

In regard to the marketing of TVA emblem appliances throughout the country, recently announced, Mr. Lillenthal said that although there is a great deal of interest over the country in the EH&FA program, there will be no financing of appliance sales outside the Valley for the time being.

Chicago Graybar to Sell Hurley Products

CHICAGO—New distributor for products of the Hurley Machine Co. is the Graybar Electric Co. here. The Hurley line includes Thor washers and ironers.

HIGH PEAKS . . . SHALLOW VALLEYS!

BILL, I'VE BEEN WATCHING YOUR SALES REPORTS PRETTY CLOSELY AND I'M WONDERING WHY YOU DON'T HAVE ANY OFF-SEASON SLUMPS LIKE THE REST OF THE BOYS

WELL, CHIEF, I'VE GOT AN AIR-TIGHT SYSTEM FOR LINING UP GOOD PROSPECTS IN ADVANCE



H-M-M! LET'S SPREAD THE GOOD NEWS AROUND. DON'T KEEP IT TO YOURSELF.

IT'S LIKE THIS. DURING PEAK SEASON I GET A LOT OF HOT LEADS SO I'LL HAVE PLENTY OF PROSPECTS TO WORK ON WHEN THINGS COMMENCE TO SLOW UP. THAT FILLS UP THE VALLEYS OR WHATEVER JOE CALLS 'EM ON HIS SALES CHART.



EASY. EVERY TIME I CALL ON A HOUSE WHERE THEY'VE GOT A BOX WITH METAL TRAYS, I OFFER TO GIVE 'EM A FLEXIBLE RUBBER TRAY FOR THE NAME OF EVERY PROSPECT WHO BUYS A REFRIGERATOR FROM ME. WORKS SWELL.

YEAH, BUT HOW?



WELL, I'LL BE DOGGONED! THAT IS A SCHEME! TELL THE REST OF THE BOYS TO COME IN, WILL YOU?

SURE, CHIEF.



--AND THAT, MEN, IS BILL'S SYSTEM. AND IF YOU DON'T THINK IT WORKS, JUST TAKE A LOOK AT HIS OFF-SEASON SALES. NOW I WANT YOU ALL TO USE BILL'S SYSTEM AND WE'LL SEE WHAT HAPPENS.

OKAY, CHIEF.

SOUNDS LIKE A GREAT SCHEME.

ME FOR IT.



MONTH LATER

BILL, TAKE A LOOK AT THIS SALES CHART SINCE ALL THE BOYS HAVE BEEN PUSHING FLEXIBLE RUBBER TRAYS AND GRIDS. TALK ABOUT FILLING UP THE VALLEYS! BY THE WAY--NOW THAT JOE'S LEAVING--HOW'D YOU LIKE TO BE SALES MANAGER?

GREAT! MAYBE I CAN FIGURE OUT SOME MORE WAYS TO BOOST SALES WITH FLEXIBLE RUBBER TRAYS.



It will pay you to insist that Flexible Rubber Trays and Grids be included as standard equipment in all the refrigerators you sell. By so insisting you'll sell more refrigerators—and sell them easier.

Try this method of Leveling out Sales Valleys

There will always be peaks and valleys on the sales chart. But you can make the peaks higher with fewer deep valleys if you'll induce all your salesmen to use Bill's system and feature Flexible Rubber Trays and Grids. To the best of our knowledge, it's a system that never has been known to fail.

The demand for these modern time and trouble savers is growing bigger every day. Already 3,000,000 have been sold—more than a million last year alone. In

1934, 90% of all automatic refrigerators manufactured will be equipped with them. Today you can't call a refrigerator really modern unless it is so equipped.

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THE INLAND MANUFACTURING COMPANY, DAYTON, OHIO

Flexible Rubber Trays and Grids

ICE CUBES THE MODERN WAY

SERVICE

Universal Cooler Manual Tells How to Select & Install Tubing

DETROIT—Factors to consider in the selection of piping materials for installation of refrigeration systems, physical properties of various types of tubing, and methods of installing refrigerant tubing in commercial systems are discussed in Universal Cooler's new 1934 *Installation Manual*.

The *Manual* first urges strict adherence to local code regulations covering refrigerant lines, and suggests that the installation engineer familiarize himself with local regulations since they vary considerably from one locality to another.

Next it outlines three kinds of refrigerant tubings which are recommended for commercial refrigeration installations. These are:

1. Soft drawn copper tubing, dehydrated and sealed, using S.A.E. flare fittings;

2. Hard drawn copper tubing, using streamline soldered fittings;

3. Galvanized pipe, using threaded fittings.

"Soft drawn copper tubing is well known in the refrigeration industry, its use with the smaller sized units being almost universal.

"Hard drawn copper tubing is becoming increasingly popular, especially for use with the larger machines. The use of streamline fittings makes possible a job mechanically correct, and neat in appearance," the *Manual* states.

"Galvanized pipe has been adopted extensively in refrigeration, its use being carried over from other industries. To the average mechanic familiar with galvanized pipe in work not requiring gas-tight joints, its use in refrigeration work presents some problems. Galvanized pipe is satisfactory, and its use will be continued for some time. However, the advantages of hard drawn copper tubing over galvanized pipe are obvious.

Use of Hard Drawn Copper Tubing

"After the condensing unit and coils are installed, the tubing, which is supplied in 20-ft. lengths, may be cut to size, using a sharp pipe cutter.

"A sharp tool, used properly, does not throw a burr on the inside of the tube. If a dull tool is used, the burr must be trimmed with a file, and care taken to remove the filings. The presence of this restriction in the line causes unnecessary resistance to the flow of refrigerant.

"When handling this tubing, care should be taken to keep it free from all foreign matter such as water, sand, rocks, and dust.

"After cutting the tubing to size, it must be cleaned by using a swab or a cloth slightly dampened in alcohol. The procedure is the same as one might follow in cleaning a gun barrel. Such a practice is strongly recommended, and insures a clean dry job, free from all foreign matter. The unit and coils are cleaned by the manufacturer under close inspection, and a continuation of this practice by the installation crew means considerable in the elimination of troubles.

"In making the joints, the following procedure should be used:

1. Fit joints for size.
2. Remove and clean the common surfaces on tube and fittings using steel wool.

3. Wipe joint with clean cloth.
4. Apply acid-free solder flux. Use only sufficient flux to cover the surface.

5. Fit joints and locate tubing.

6. Apply heat to the joint with a torch, making sure to get an even temperature. Heat all of the surface at the same time. Do not attempt to spot solder.

7. When the joint has reached a temperature above the melting point of solder, apply the solder around the edge of the fitting. (Solder is drawn into the joint by capillary attraction, and if care has been taken in cleaning the joint, a smooth, well filled joint will be obtained.) Use sufficient solder. Some experience will be necessary in judging the proper amount.

8. Allow to set before moving or stressing.

"Joints may be heated with the ordinary type of gasoline torch; however, an acetylene torch will be found superior due to its providing a hotter and cleaner flame. An acetylene torch is simply a special torch connected by means of a rubber hose to a tank of acetylene gas," according to the *Manual*.

"With hard drawn copper tubing, threaded adapters are used to connect the line to the compressor, etc. Before screwing the adapter in place, the threaded portion should be coated with a good mixture of litharge and glycerin.

"It might be well to add that when screwing the adapter in place, a section of scrap pipe of the proper size should be inserted in the fitting to

prevent the section from warping out of shape or closing up.

Galvanized Pipe

"Cleaning methods, as outlined above, also apply when using galvanized pipe. When making up pipe, it is well to use a set of sharp dies which permit a better thread, and, consequently, a tight joint. Litharge the threaded sections and use ground unions whenever necessary.

"Support all pipes well with hangers or pipe straps. It is well to include an insulator between the strap and the pipe, as the use of different metals in each will cause an electrolytic action to be set up—with ensuing damage.

"Whenever possible, provide a slight draft in the suction line to favor the unit. If, due to appearance, this is not possible, at least insure a level line.

Table I lists the various suction and liquid line sizes for the various capacities of condensing units. Unless otherwise stated, units are fitted with liquid and suction fittings for S.A.E. flare connections.

TABLE I
Practical Sizes of Refrigerant Lines
For Various Sizes of Units

Unit Size (Motor Hp.)	Suction Line (Up to 50-ft. runs)	Liquid Line (Up to 50-ft. runs)
1	One 5/8 in.	3/8 in.
1 1/2	One 5/8 in.	3/8 in.
2	Two 5/8 in.	3/8 in.
3	Two 5/8 in.	3/8 in.
5	Two 5/8 in. or One 1-in. Pipe	3/8 in.
7 1/2	One 1 1/2-in. Pipe	3/8 in.
10	One 1 1/2-in. Pipe	3/8 in.
15	One 1 1/2-in. Pipe	3/8 in.

Few Distributors Set Up for Refinishing

DETROIT—As the general quality of lacquer is being steadily improved upon, distributor-dealer service departments are finding demands for cabinet refinishing to be fast dwindling, with most of the jobs that do occur of a minor nature.

Only in rare instances are distributors equipped to do refinishing of porcelain cabinets, according to engineers at refrigerator factories. The outlets secure from their manufacturers porcelain-finished panels with which they replace the damaged parts of porcelain cabinets.

"Our distributors are seldom called upon to refinish lacquer cabinets nowadays," says I. H. Reindel, chief engineer of Norge Co. "So many refinements have been made in lacquers that discoloration is almost nil—repair to the finish is necessitated only by damage through rough handling.

"Some companies have their own equipment for spraying cabinets, but generally our wholesalers send the boxes to some local paint shop which does the lacquer work according to factory specifications on both materials and workmanship. Some lacquers now available are so durable that they hold up surprisingly well even in climates most destructive to finishes."

Leonard Turnbull, head of Specialties Distributing Co., Detroit Grunow distributor, reports that in two seasons with the Grunow line, the latter's Dulux finish has not once required repair because of chipping, cracking, or discoloration.

Rope burns, acquired during transport from the distributor to the dealer, are the most common cause of damage to the finish, according to Mr. Turnbull. In such cases, the damaged part, or the whole cabinet, is returned to the distributorship where it is Dulux-sprayed with a DeVilbiss spray outfit. When a cabinet is badly bumped, the wholesaler recommends that the dealer sell it at an "abused-model" price.

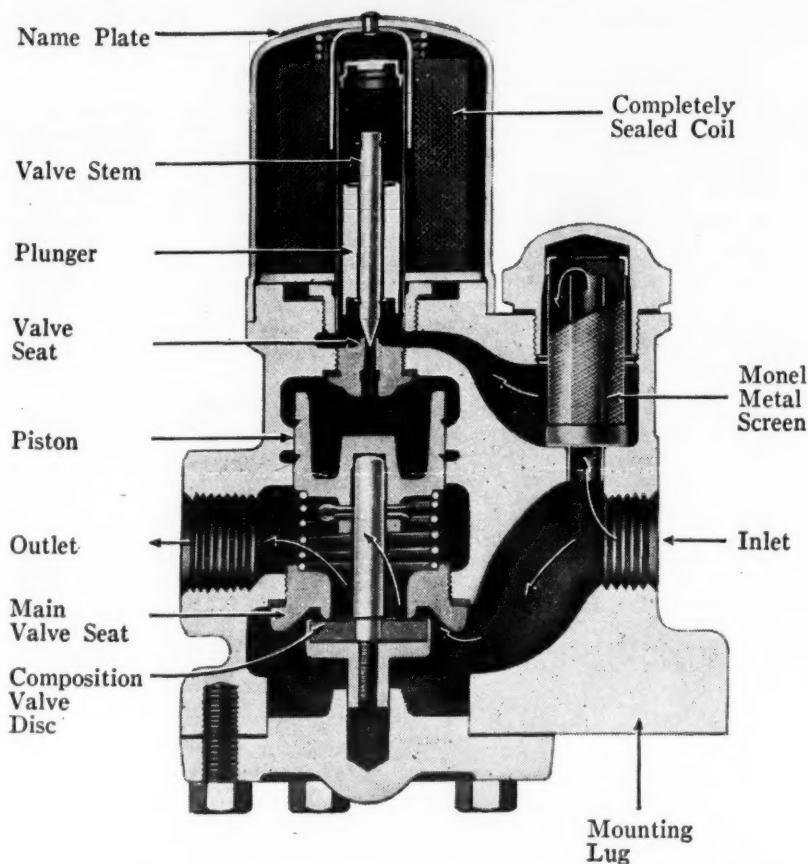
Caswell, Inc., General Electric distributor here, carries a complete stock of porcelain panels for use in repairing damaged porcelain cabinets. And in its service shop is a \$500 DeVilbiss spray outfit for repairing lacquer boxes. The equipment consists of a metal spray booth with an exhaust fan, a compressor, and a gun.

President S. C. Caswell comments on this particular service problem: "Practically all lacquer refinishing necessary in the past two years has been on very old cabinets the finish of which has worn off from long use. We no longer have trouble with fading in lacquer—in fact, we have almost no trouble with the lacquers now being used."

Westinghouse Electric Supply Co. in Detroit has no facilities for doing repair work on finishes. It carries a supply of panels for repairing porcelain cabinets, and sends its lacquer work to a local paint shop. As yet, there has been no occasion for repairs to the Westinghouse Dulux cabinets, but the distributor has learned that Detroit's Wolverine Enameling Co. can re-Dulux small cabinet parts.

The panel-replacement method is used on porcelain cabinets by Kelvinator distributors, according to E. A. Seibert, service manager at the Kelvinator factory. They generally have spray guns in their service shops for "touchup" jobs on lacquer cabinets.

New Refrigerant Control Valve



A cross section of the new model 70-N refrigerant control valve of Automatic Products Co., Milwaukee. Operation is explained below.

Automatic Products Co. Develops Refrigerant Control Valve

(Concluded from Page 1, Column 2)
pass into the chamber above the piston. This piston is connected directly with the main valve. Since the area of the piston is greater than the area of the valve, a pressure is built up, and as this occurs, the piston is forced downward automatically opening the main valve.

When the solenoid is de-energized, the needle comes down closing the by-pass valve. The piston and main valve are then returned to their original positions by action of the coil spring. The valve closes with the flow of the liquid, forming a seal.

To prevent grit or other foreign materials from entering the piston chamber, a Monel metal strainer is provided. This can be removed for cleaning, and is designed so that all grit will be removed with it.

Body and piston of the valve are of cast iron. The plunger and needle valve are of stainless steel, and the valve stem and main valve are of brass.

The plunger and valve stem "float" in the coil, and do not touch the top of the guide tube. The plunger and valve stem are enclosed in a tube which is sealed tight so that no leak-

age can occur. Both tube and valve stem are non-magnetic so that no mineral particles will be attracted to them.

The coil is sealed with a plastic material to keep out moisture. A 28-in. lead-in wire is furnished with each valve. These wires enter the body through a hole which is tapped to receive 1/2-in. standard conduit or BX fittings. The valve is finished with a black crinkle material.

Power consumption is about 12 watts, and the coil is so constructed that the current can be kept on indefinitely without danger from overheating. Valves are offered for 110 or 220 volt, 25, 50, and 60 cycle alternating current, and for 115 and 230 volt direct current.

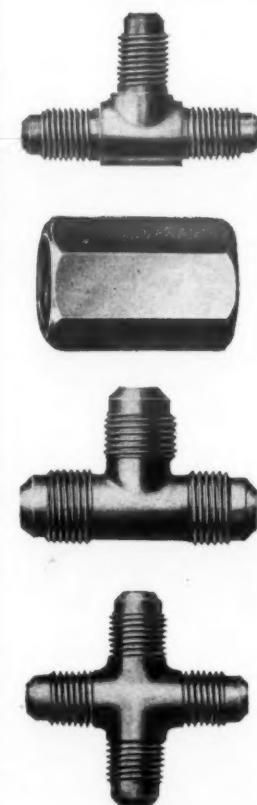
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SERVICE

Correct Testing Helps Service Man Diagnose Motor Trouble

By Charles L. Chittenden

Superintendent, Refrigeration Motor Service, Long Island City, N. Y.

BEING the source of power for the electric refrigeration unit, the electric motor is frequently looked to for trouble when the actual defect is not in the motor, and often users (and many refrigeration service men) will lay the fault directly to the motor. Many motors are removed from the units which upon inspection are found to be in good operating condition, and lacking the ability to diagnose their motor trouble, many service men must install a duplicate or reliable tested motor before they find that the real fault was not in the motor.

This is a very costly procedure of testing, and so this article was written to assist in reducing motor service costs.

A recent check of the records of the Refrigeration Motor Service Co. shows the possible number out of every 1,000 motors which the service man might, with the aid of proper testing instruments, working tools, and replacement parts, be able to repair in the field.

Such repairs effected on the job would necessarily show considerable saving in the actual money cost, and in addition, real benefits will be derived by giving the customer an immediate service, thereby retaining his good will.

Record of 1,000 Household Motors Serviced

Minor Rebuilding (Repairs or Adjustments)

911—1/10 to 1/4 hp., all popular make motors, as follows:

192—No repairs—just general clean up.

285—New brushes—commutator resurfaced.

362—Pulley end bearings, with 82 commutators resoldered.

72—Both bearings, with 16 commutators resoldered.

Out of the 911 motors requiring minor repairs, there were 42 needing new brush-holders, and 58 governor springs were changed.

Major Rebuilding (or Repairs)

74—1/10 to 1/4 hp., all popular make motors, as follows:

26—Stator rewound.

48—Armatures rewound.

Out of the 48 armatures which had to be rewound, there were 38 of these which had bakelite constructed commutators, and it was only possible to use three of these in rewinding, the balance being supplied with new commutators, while the other 10 armatures had commutators of a different construction, and all were used when rewinding.

On the entire 74 major repair motors, other minor repairs were made using such parts as bearings, brush-holders, brushes, etc.

Completely Rebuilt Motors

15—1/10 to 1/4 hp., two popular makes.

Out of this number all had the bakelite designed commutator, and all required the installment of a new commutator.

In explaining the various classifications, which the writer established a number of years ago when studying refrigeration motor repairs, "Minor Rebuilt" is arranged to cover all motors not in need of rewinding.

"Major Rebuilt" are those in need of minor repairs and in addition the rewind of the armature or stator, and in the case of direct current the armature or the field coils.

"Completely Rebuilt" is intended to cover the minor repairs and the rewinding of both the armature and the stator, or in the case of direct current motors, the armature and the field coils.

The above record shows that the service man could repair at least 9 out of every 10 motors, and yet if his average was only 7 out of 10 it would certainly show a wonderful profit.

There were 192 motors that never should have left the unit, and 285 on which a brush exchange and the use of a commutator stone would have kept them in operation, or a total of 477 motors on which a lack of knowledge was the other fellow's profit.

To the 477 may be added 434 on which the service man could expend a small amount for replacement bearings and parts, and with the proper tools, reduce his minor motor repair costs to the minimum.

Electric Motor Tests

These tests cover only the alternating-current, single-phase, repulsion-induction motor of the popular brush-lifting types. To distinguish such motors they have the vertical commutator.

To make the necessary electric

motor tests in the field does not require an elaborate assortment of instruments, and the writer only advises the following:

One 220-volt, 60-watt, carbon filament lamp, sealed in a rubber-covered socket, and the globe barred around with friction tape to prevent flying glass, should it break. However, as an alternative for this and for a more convenient test there is a patented, vest pocket neon tester.

The other instrument necessary is a portable a.c.-d.c. wattmeter, with a scale graduated up to three kilowatts for the household unit or seven kilowatts for the commercial installation. In the procedure of testing the mechanic will find that these two instruments will meet all his needs.

Follow Tests in Sequence

Tests should be performed in sequence, and if followed properly should tell the service man exactly what is wrong with the motor.

1. *Current*—With the test lamp in series, check all fuses on both main fuse box and those near the motor. The lighting of the lamp will show if the current carries through the fuse.

Note: At this point it is always advisable also to check and see if the motor has the proper fuse, and on the plug fuse if it might be backed with a penny, or the cartridge fuse jumped with wire, because should a service man work on a defective motor with such fuses, it might result in serious injury to himself. Should he desire a fuse which does not blow at the first instant of trouble, it would be advisable to use the new patented thermal fuse.

2. *Loose Connections*—Apart from blown fuses, loose connections sometimes exist and are a potential hazard, often causing lines to heat and break into flames. Test this by taking notice of rubber-covered wire to see if it shows that it has been subjected to excessive heat. Locate a loose connection by close observation and by shaking the wire.

3. *Automatic Switch*—See that the faces of all contact points are true seated and free from corrosion. When the switch is closed, insert the test lamp in the circuit to see if it is complete.

4. *Motor Lead Connections*—Check the connection where the motor leads are attached to the switch line. In many cases careless mechanics just twist these leads together. If a screw connector is not available, these should always be soldered, because vibration often works them loose and causes serious overheating or blown fuses.

Test with a lamp having all switches closed and see if the current reaches the motor. (Note: If the motor operates some of the above items may be omitted.)

5. *Motor Inspection*—(Caution: Do not apply current to a motor until you have made the following inspection.)

A. Turn over motor by hand for frozen bearings, or friction between armature and stator cores.

B. Remove cover plates and inspect windings for possible burnt out coils.

C. Inspect brushes for length and sticking in the brush-holder guides.

D. Inspect brush-holder to see if it has loosened from commutation position.

E. Inspect commutator for loose bars, scoring, or dirty surface, and to see if it has thrown the solder and loosened the coil leads.

F. Check compressor load being certain it is not in excess of the horsepower of the motor. (Ample overload tests with the watt meter will be described later in this article.)

6. *Motor Operation*—If all visible inspections are satisfactory, then apply the current and observe the actions of the motor. This can first be done with the compressor load and if not satisfactory, remove the belt and operate the motor idle.

7. *When Motor Operates*: A. *Commutation*—Regardless of the motor's operating condition, be very certain that the commutator is clean, free from protruding mica, and that the entire number of brushes seat on the commutator.

B. *Bearings*—If bearings are worn, the motor is usually noisy. You can determine their condition by observing the play between the armature shaft and the bushing.

C. *Brush-holder*—When this is defective or worn, it will show up in

considerable play under movement of the hand. In cases where the brush-holder has ejection fingers and these are worn, the motor will not short circuit properly. Check spring tension against the brushes; if these are weak there will not be sufficient pressure of the brushes on the face of the commutator.

D. *Governor Springs*—When this spring is weak, the motor comes up to throwout speed too early for the motor to carry the load. This can be easily observed by the brush-holder constantly lifting the brushes from the commutator.

E. *Short Circuiting Device*—(This device has many names such as: Necklace, short circuit weights, short circuit segments, spring collar, etc.) It plays a very important part in the correct function of the motor. The principal defects are burnt segments or contact surfaces.

When this condition is extreme the motor fails to change from repulsion to induction, or if it does change then only parts of the armature winding are short circuited.

F. *Governor Weights*—Check for broken weights, or stiff action. Faulty governor weights affect the operation of the motor to the extent that it is slow to change to induction.

G. *Governor Weight Pins*—(Sometimes called push rods.) If worn, the motor will not change from repulsion to induction.

8. *When Motor Fails to Operate*—Remove compressor belt or coupling, and take the motor from the unit. Release and remove the end frames or bells. Remove from the armature the short circuiting device.

A. *Stator Tests*—The average stator had four leads brought out especially for 110 and 220 volt operation. Two of the leads are connected to one-half the winding and the other two to the other half.

With the use of the series test lamp, check between each lead and the stator iron for possible grounded windings.

In connection with the wattmeter, check the winding of each half separately. Each half should have the same reading if they are not shorted. Should one have a higher reading than the other, then the one with the highest reading has shorted coils.

B. *Armature Test*—If the stator coils show an equal reading and it is not shorted or grounded it may be used as a growler to test the armature, and is very valuable especially when the armature has commutator cross connections.

To test, connect the wattmeter and line on the 110 volt stator connections, then place the armature inside the stator core just as if you were going to assemble it. With the hand rotate the armature slowly in the stator.

If the needle of the meter does not travel back and forth as the armature is rotated then the armature is clear, however, should the needle register high and then low readings the armature has shorted coils or commutator.

9. *Overloaded Compressor Test*—Connect the motor to the line for regular operation and then place the wattmeter in the circuit. In order to get a correct check of the power for idle, load, and overload operation, the service man should have compiled a list of the readings of the various manufacturers' motors at the different horsepower.

However the following ratio will be found satisfactory for most any field work.

First, take the reading in watts of the motor running idle. It will be noticed that the starting watts are about five times the actual running reading.

Second, put load of compressor on the motor, being certain to release any extra pressures. The full load watts should then be about three times the idle running watts, and the full load starting about three times the full load running.

If the compressor has an overload,

then the running watts will be in excess of three times the idle watts. One hundred per cent overload should show the running watts to be about twice the full load or six times the running watts idle.

The starting watts at 100 per cent overload will be about double the 100 per cent overload running watts.

Almost any household unit motor should pull 100 per cent overload for a period of time without excessive overheating, and service men should not be alarmed to find some overload in extreme hot weather, especially if there are high head pressures.

Installation of Bearings and Brushes

10. *Installation of Bearings*—It is possible with the proper tools and special designed bearings of undersize bore, for service men to make installation of motor bearings.

In many cases it is possible for service men to handle the bearing situation by the exchange of the end frame with the bearing properly installed by some reliable motor repair shop. We now supply some of our customers with these.

11. *Installation of Brushes*—Many service men make a mistake with the motor brushes, and neglect to consider that the motor manufacturers have had in their employ years, electrical engineers on research work to develop for each motor they design a brush of the correct material and grade.

Many men and even motor repair shops will place into the brush-holder of a motor any piece of carbon or graphite as long as it fits the holder, and then wonder why the motor does not carry the load or function properly.

On the market today there is a large variety of makes, types, and grade, some of which certainly do not meet with the manufacturers' specifications. Care should be exercised in the selection of the proper motor brush.

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PARKER

RUST-PROOFING

processes

BONDERIZING
PARKERIZING

ELECTRIC REFRIGERATION NEWS

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Published Every Week by
BUSINESS NEWS PUBLISHING CO.
5229 Cass Ave., Detroit, Mich. Telephone Columbia 4242.
Production Dept., 550 Maccabees Bldg., Columbia 4245.

Subscription Rates—U. S. and Possessions and all countries in the Pan-American Postal Union: \$3.00 per year; 2 years for \$5.00. Canada: \$6.00 per year (due to special tariff). All Other Countries: \$5.00 per year (U. S. Money)

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VOL. 12, No. 17, SERIAL NO. 283, AUGUST 22, 1934

Market Saturation

E. L. TRIFFIT of Brooke, Smith & French, advertising counselor to Kelvinator Corp., has a theory that one of the big reasons why the electric refrigeration industry was so successful during the depression years is to be found in a study of saturation figures.

During the depression, he says, people wouldn't buy; they had to be sold. A convenience with universal appeal which was ripe for specialty salesmanship, then, should do comparatively well at that time. It should be noted, he points out, that an appliance is susceptible to specialty promotion only when its market is between 15% and 40% saturated. Electric refrigeration being the only specialty appliance with a saturation point between those figures during the depression years, it was the industry elected to enjoy good business.

Stable Annual Output Predicted

But now, Mr. Triffit warns, the industry should not expect to continue its rapid rise a great deal longer, even though general business conditions improve materially. The nearer an industry approaches the 40% saturation mark, the slower its ascent; and from 40% upward the business is likely to settle down into a stable annual output of a staple commodity, according to Mr. Triffit's theory.

The saturation bugaboo is beginning to bother more than one executive. Witness, for instance, this letter from the manufacturer of one of the component parts of household electric refrigerators:

Parts Manufacturer Thinks Ahead

"One of my associates is inclined to fear that the saturation point of electric refrigeration will be reached in a relatively short time. Would it be troubling you too much to give me the progress of saturation for the last five years (based, as usual, on the electrically wired homes)?"

"Do the informed men in the industry look for any serious decrease in volume of sales, say, over the next 10 years because of saturation? If so, does such opinion contemplate a reduction in annual sales of as much as 25%, 50%?"

"Is it reasonable to believe that a desire of owners of small refrigerators to buy larger refrigerators, and the improvements of today and tomorrow as against the boxes bought a few years ago, and the fact that a good many very poor electric refrigerators were turned out in the past five or six years, and other factors, will balance the slowly increasing saturation, for a number of years to come?"

Estimates of Refrigeration Saturation

The first estimate of household electric refrigeration saturation made by **ELECTRIC REFRIGERATION NEWS** was that as of Jan. 1, 1931, at which time it was computed that there were 3,000,000 electric refrigerators in use, making a wired-home market (United States) saturation of 14.7%. As of Jan. 1, 1932, 3,528,000 refrigerators were in use, and the market saturation was 17.5%. By Jan. 1, 1933, the number-in-use figure stood at 4,000,000, and the saturation

estimate at 20.12%. On Jan. 1, 1934, the **NEWS** estimated that 4,665,000 electric refrigerators were in use in the United States, making a market saturation of U. S. wired homes of 23.5 per cent.

Even at this rate of saturation it would seem that it might take a number of years to exhaust the existing market. It is also well to remember that the current rate of increase in the percentage of saturation is fairly high, inasmuch as practically all of the electric refrigerators now being sold are installed in homes which did not have modern refrigeration before. Most of the electric refrigerators now in use have been bought within the last four or five years, hence replacements—save in the apartment house field—have not yet begun to become a factor. Undoubtedly the replacement market will be a much more important consideration each year in the future.

Replacements May Become Important

While it does not seem reasonable to expect that the public will respond to the appeal of annual new model refrigerators to the point where owners of last year's model will want to trade it in on the current model—as has been made fashionable by the automobile industry—it is quite possible that families which bought their first electric refrigerators five, six, and seven years ago may be ready to consider the advantages of newer models. Frigidaire advertising ("Ours is a Frigidaire '34") is playing on that theme this season.

It also seems rational to assume that the family which is considering the purchase of a refrigerator for a second time will be much more susceptible to arguments for quality and durability than the inexperienced buyer who has no basis for appreciating good points in construction.

The possibilities for the sale of secondary refrigerators to present owners are just being explored for the first time by manufacturers this fall, with the introduction of the low-priced chest models. With these models manufacturers are also trying to push farther down into the low-income brackets of the nation's population.

Good Business Should Continue

And so, even though it doesn't seem reasonable to suppose that the industry can keep on forever selling an increased number of units each year—and thus it should be expected that the curve of annual sales will flatten out in time—prospects do seem good for a continuation of excellent business in the electric refrigeration industry over a considerable period of years.

In expressing this viewpoint the **NEWS** indulges in no forced enthusiasm. As evidence of its faith in the future of the refrigeration industry, it has recently acquired a substantial property for housing the offices and plant with a view to expanding its facilities so as to serve the industry better in the years to come.

WHAT OTHERS SAY

Transplanting People

THE AAA has not given up its plan to move farmers from the ruined lands of the Dakotas, Wyoming, and Montana, despite the outcry which Dr. Elwood Mead's statement urging such a course has brought from officials of the states which would be affected. The program involves a voluntary migration of thousands of families from a region, which Dr. Mead holds to have been always too arid for cultivation and which today has been devastated by the drouth to an extent, in his opinion, which makes farming a perfectly hopeless endeavor.

It cannot be said that the experience of other agencies of the New Deal is highly encouraging to the AAA. As Paul W. Ward recites in *The Baltimore Sun*, the FERA and the TVA have both sought to do some of this transplanting of considerable bodies of people, and have both found it a difficult if not an impossible business. Mr. Hopkins was all for taking "stranded populations" to other settings. But he learned that his scheme would not work "on any broad scale," because "human beings, unlike cattle, couldn't be moved..." They refuse to be uprooted.

The same discovery has been made by the TVA, says Mr. Ward. "Its efforts to lure the mountaineers down from the hills into the valley where they may become consumers of the huge power output which the TVA is projecting have been singularly unavailing, according to reliable sources. The hillbillies, it seems, don't care a thing about electric lights, electric refrigerators, bath tubs, running water, modern plumbing, modern houses. What was good enough for grandpappy, it appears, is still good enough for them, and they propose to remain in the hills..."—*The Baltimore Age-Herald*.

LETTERS

Lack of Knowledge, Disregard of Dealers

Jesse French Co., Inc.
Wholesale—Retail
Distributors of Norge refrigerators
and Bosch radios
Mobile, Ala.

Editor:

In your issue of Aug. 1 in regard to TVA comments, we notice that you say you have no complaints coming from Alabama on the activity of the Alabama Power Co. and other TVA outlets. We cannot understand why the Alabama dealers have not been more prone to defend their rights.

We are Norge distributors in Mobile and we have been advised by the proper authorities that the TVA Norge boxes to be sold at \$79.50 are to be purchased by us at \$63.00 f.o.b. New Orleans, which would lay this merchandise at our door at \$65.00. We are to perform the service of selling these, paying commission to a salesman, guarantee the contract over a period of three years, and give one year's service on this TVA refrigerator, all for a total gross profit of \$14.50.

If the government has such smart men in control of their public subsidized divisions, we think it would be a very apt lesson to put some of them in the refrigeration business and let them show us how they can make a net profit on the \$14.50 gross on the basis outlined. The whole program on the part of TVA and Mr. Lillenthal, in our estimation, shows a complete lack of knowledge of retail merchandising and also shows a complete disregard of dealers on the part of manufacturers cooperating in this program. The independent dealers throughout this section have been totally ignored in the whole proposition and it is positively suicidal for any dealer to go forward on the TVA plan of selling and financing TVA refrigerators.

We believe that every independent dealer in the city of Mobile would say the same thing, that an electric refrigerator cannot be sold for a gross profit of \$14.50 regardless of quantity sold and the entire program is confiscatory of our business and in that respect strictly unconstitutional.

JESSE FRENCH,
President.

So We Can't Take It, Eh?

Electricity Meter Mfg. Co., Ltd.
Sydney, Australia

Editor:

One good "Austrian" has returned to the land of his birth after quite an interesting and pleasant sojourn in your country.

Friend Lovelock is very interested to know what George Taubeneck looks like, but he also has come to the conclusion that G. F. T. "cannot take it."

Would you be good enough to advise the Publishing Department to readress my subscription to **ELECTRIC REFRIGERATION NEWS** as above.

I intend writing you in full a newsy letter as soon as I have settled down here. In the meantime, best of good wishes.

A. A. McCULLAGH.

Service and the Codes

The Chandler Hardware Co.
Sylvania, Ohio

Editor:

Is there any particular ruling in any electrical codes or retail code regarding the servicing of electric refrigeration either within or without warranties given by manufacturers. We have in mind sending out a letter to all of our owners of electric refrigerators outlining our policy on service, but before doing so we want to be certain as to just where we stand in relation to any of the codes which might be applicable.

Also, we are interested in getting names of dealers about the same size as ourselves as to the amount of service work they are having. This is our fourth year with Kelvinator and we are having too much service trouble. We have 192 owners divided as follows:

Year	No. Sold	Service Calls
1931	12	22
1932	40	79
1933	75	163
1934	65	41

We also have indicated above the total service calls rendered to date on each year's boxes. We would like to have the names of a half-dozen representative dealers having about the same number of refrigerators out in owners' hands. We would like to write them to see how many service calls they are having. If possible, we would like to have the names of two or three dealers handling Frigidaire, Kelvinator, General Electric, Westinghouse, and Norge as we feel these are probably the five leading makes.

R. A. CHANDLER.

Answer: To our knowledge there is

no provision in the code of fair competition for the electric refrigeration industry or for the retail code which covers the servicing of electric refrigerators.

However, before advertising any policy on service, it might be well to study Article IV of the electric refrigeration code, which deals with the advertising and promotion on warranty and service policies; and Article IX of the retail code, which covers advertising practices by retailers.

Seeger Caskets?

Bain Hardware Co.
Builders' Hardware, Cutlery, Tools
Paints, Stoves and Ranges
Electric Refrigerators
Wholesale and Retail
Lexington, Ky.

Editor:

We have at hand your issue of Aug. 15 of **ELECTRIC REFRIGERATION NEWS** and note the article of page 10 headed "Novel Florists Shop Has Seeger Cabinets."

The fourth paragraph of this article states that Mr. Ottman's customers visit the cemetery across the street, come to his shop for lunch and flowers and then return to the cemetery. Please advise us if it is the lunch or the flowers which sends them back. Personally we think he has a contract with the local undertaker.

We have been considering visiting Elmhurst, thanks for the tip, we won't go to Mr. Ottman's.

This is the first time we have heard of Seeger cabinets being used for caskets.

W. L. BAIN, JR.

Holmes Machine

342 Braddock Ave., Uniontown, Pa.

Editor:

I have received a call to service a Holmes domestic refrigerator using a capillary tube from the receiver to the evaporator, and I am desirous of knowing what the proper gas charge is for this machine, and also what kind of gas was originally employed.

Any other operating characteristics would be appreciated.

We have found your publication, **ELECTRIC REFRIGERATION NEWS**, very helpful, and hope to continue to publish service notes on orphan refrigerators from time to time.

E. VERNON BLACK.

Answer: The Holmes refrigerator used ethyl chloride for refrigerant. It went out of production in 1929. Other than that we have little information about it on tap. However, this make is one on which we are hopeful of securing service instructions, and incidentally would greatly appreciate the use of a Holmes service manual should any subscriber have one available.

Wanted—Information

Wenona, Ills.

Editor:

As I have not heard from you as to previous letters could you tell me best refrigerators to sell where secure each also for all in the country and so on and are all O.K. cost of running each and so on will they spoil how long will stuff keep and so on also will they taint also each other and so on always run O.K. and so on life of and so on and O.K. during all what cost also sell at and is it prepaid or cost more also all over the U. S. and so on and O.K. everywhere.

Also could you tell me where secure best extracts or what best to sell for ice cream will it freeze out cook out and so on also for large plants and so on all over the U. S. and so on also ditto coloring or what best will it poison and so on in fact all in letter also where secure all kinds of wrapping paper each for same also where secure best formulas for ice cream to make for a Treasury train also where secure other ingredients for same each also is make a hit with all.

Also what are the chances of selling your magazines what cost also sell at and is it prepaid or cost more also best you can do on also are yours the best of the world over also besides yours also would you tell me the names and addresses of all magazines and so on the world over all also small towns and so on each and what published and correct when published also sent out also monthly or what also size of and so on also would you quote price of best they can do on all also sell at and is it prepaid or cost more also ditto 1 issue on up to 10 years and on up also ditto back numbers also best to sell as they come also a good idea to carry stock if so what also in fact all in letter and how far O.K. also what best to sell at worlds fair to start with of newspapers and magazines also afterwards from stands also what kinds of fruits best to sell at worlds fair at a fruit stand also what put in and so on also where secure each.

What refrigerator best to sell or what to restaurants, hotels and so on also in large cities and so on also as to price quality and so on also how electricity will all use and so on.

Please answer at once as I am needing information badly please rush by return mail.

GEORGE S. CUSOE.

SERVICE

How to Service Machines Using Automatic Expansion Valves

Complaints on Expansion Valve System Analyzed With a Summarizing Chart at End

By D. D. Wile, Accessories Laboratory, Detroit Lubricator Co.

THE service of automatic expansion valves on domestic refrigerators is really a very simple procedure. It involves turning the adjusting screw in or out to raise or lower the pressure, plus certain simple tests to determine if the valve is in good working order. Actually, however, the most important thing is to determine just where the trouble is before tampering with the valve or any other part of the machine.

Trouble Often Misplaced

Trouble that on first sight appears to be at the valve is often caused by:

1. Shortage of refrigerant.
2. Excess refrigerant.
3. Air in system.
4. Leaking head valve.
5. Leaking or stuck piston valve.
6. Tight compressor bearings.
7. Belt slip.
8. Tight motor bearings.

It may seem far fetched to assume that a tight motor bearing may be misconstrued as expansion valve trouble, but the author on one occasion observed a service man make this mistake. The overload cut-out would allow the machine to operate only a short time and therefore the suction pressure did not have a chance to reduce. Adjusting the expansion valve had no effect because it was closed tight anyway. The trouble was corrected by cleaning an obstruction from the oil line to the rear bearing of the motor, and then the expansion valve had to be readjusted to its original setting.

In order to service a refrigeration unit intelligently, it is necessary to have a knowledge of the simple facts concerning the performance of the mechanical parts and of the refrigerant at various parts of the cycle.

Expansion Valve Operation

Fig. 1 shows a section of the expansion valve. The needle "L" is connected to the bellows "D" by means of a rigid yoke member. The adjusting spring "C" is arranged so that by turning the adjusting screw "A," it either pulls or pushes on the bellows. When the spring is adjusted for vacuum, the valve is adjusted for vacuum and tends to close the needle against the seat "M."

When the compressor is in operation it creates a vacuum on the evaporator and this reduced pressure pulls on the bellows to open the needle and admit refrigerant to the evaporator. Just enough refrigerant is admitted to maintain the constant pressure to which the valve has been adjusted.

Should Follow Compressor Operation

When the compressor stops, the refrigerant in the evaporator warms up, increasing the pressure and causing the valve to close. Thus it will be seen that the expansion valve should open shortly after the compressor starts and it should close almost immediately after the compressor stops.

In systems operating on pressure, the action of the valve is exactly the same except that the adjusting screw is turned in to make the valve close or open at the higher pressure.

The rubber breather cap "B" prevents moisture from entering the bellows chamber when breathing occurs, due to changing temperature or to movement of the bellows. Some of the older types of valves were not provided with breather caps but instead had a sealing cap or stuffing box. Still older models were charged

with glycerine to absorb the moisture and prevent freezing.

The particular type of valve shown in Fig. 1 has a very thick oil partially filling the bellows chamber. This oil is used to prevent chattering. The valve is constructed to be entirely free of friction and would chatter were it not for the dash pot action of the oil. Note in Fig. 1 that a strainer F is provided on a convenient fitting which forms part of the inlet connection.

Chilling Unit Operation

Fig. 2 shows a schematic diagram of the evaporator or chilling unit. For convenience, the passage-way through the chilling unit is shown as a simple coil of tubing. The thermostat which controls the operation of the motor has its bulb clamped to the chilling unit near the suction line.

When the compressor starts up it pumps gas out of the chilling unit, and when the pressure is reduced to the proper point the expansion valve opens and admits only sufficient refrigerant to maintain this pressure constant. Only a small portion of chilling unit is refrigerated at the beginning of the cycle, but as the machine continues to operate more and more of the coil is cooled until the cold refrigerant finally reaches the thermostat bulb. At this instant the thermostat should cut out and stop the compressor.

It will be noted that at this time there is refrigerant in the chilling unit. It is this refrigerant that causes the suction pressure to increase during the shut down period as the chilling unit warms up.

If the thermostat should not cut out when the cold refrigerant reaches the thermostat bulb, refrigeration will continue to a point where the suction line begins to sweat or frost.

When the machine starts up on the next operating cycle, it first reduces the pressure quickly down to the boiling point of the refrigerant, and then the pressure reduces more slowly as the refrigerant continues to boil. When all the refrigerant has been pumped out, or when the pressure has been reduced to the expansion valve setting, the valve again opens and the cycle is repeated.

Little Liquid in Evaporator

It is important to bear in mind that the refrigerant leaves the expansion valve in the form of a mist. It contains considerable flash gas so that the volume of liquid is small compared to the volume of gas. At any time, therefore, there is a comparatively small amount of liquid refrigerant in the evaporator.

If the expansion valve leaks, refrigerant continues to flow into the evaporator during the shut down period and has a tendency to fill the coil almost completely full of liquid refrigerant. This condition would then show up at the start of the next operating cycle.

Instead of gas being pumped by the compressor, liquid refrigerant would flood over instead, and cause the suc-

tion line to become very cold and possibly cause the compressor to pound due to refrigerant getting into the oil of the crankcase. A leaking expansion valve almost invariably shows up in this manner. If dirt lodges under the needle, the leak may become large enough to cause high suction pressure even while the compressor is running.

Effect of Reduced Capacity

One of the unusual things about a refrigerating system is that the same type of trouble might cause too much refrigeration, or too little refrigeration. For instance, a shortage of refrigerant in a system does not effect the suction pressure, but it does reduce the capacity of the compressor unit because it allows gas instead of liquid to pass from the condenser to the chilling unit.

Now if there is only a slight shortage of refrigerant, the compressor unit capacity will be reduced only a small amount, possibly to the extent where it refrigerates the entire chilling unit, but not quite enough to reach the thermostat bulb and stop the machine. In this case the compressor would run continuously, or for long periods. The chilling unit would be kept at a temperature just above the cut out point, and therefore its average temperature will be colder than the average temperature during normal operation where the unit cycles between the cut-out point and cut-in point.

Chilling Unit

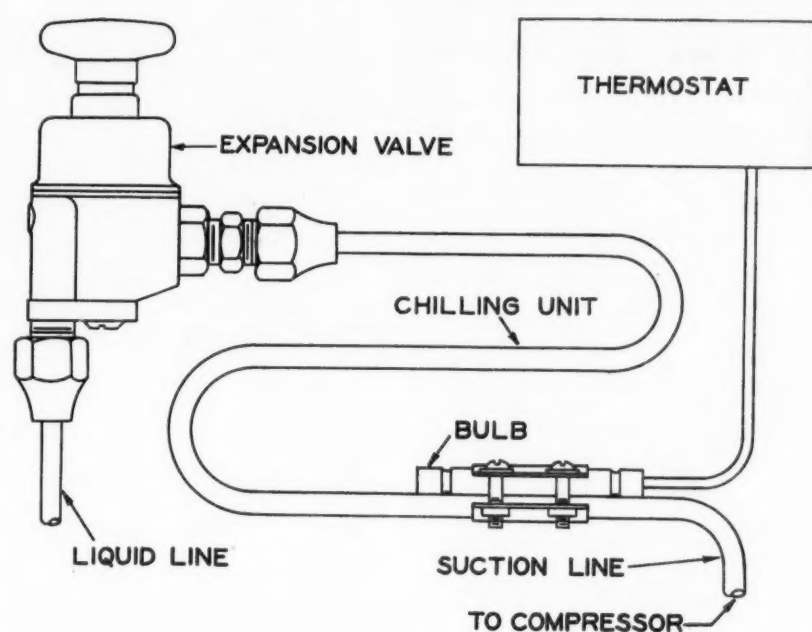
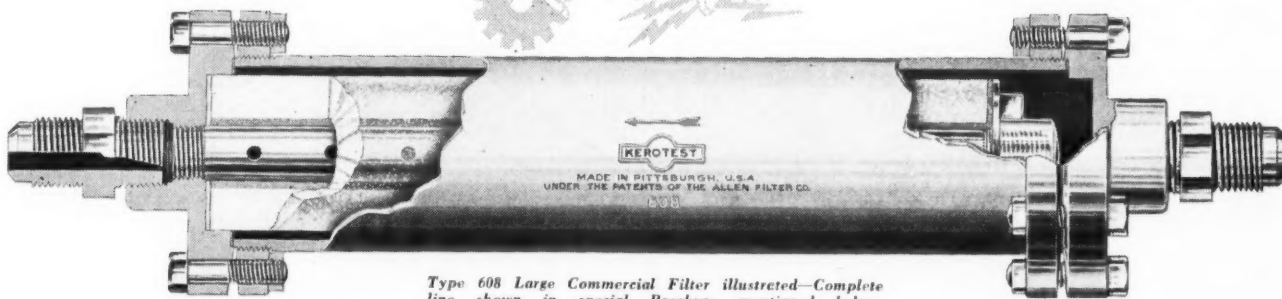


Fig. 2. Schematic diagram of a chilling unit using an expansion valve.

If a great shortage of refrigerant exists, the capacity of the compressor unit might be so greatly reduced that little or no refrigeration occurs, and in this case the machine would again run continuously, but the cabinet and chilling unit would be quite warm. (Continued on Page 10, Column 1)

a New Deal for mechanical refrigeration



Type 608 Large Commercial Filter illustrated—Complete line shown in special Brochure mentioned below.

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Completely Abolishes Clogged Float Needle or Expansion Valve Troubles

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These Filters have the GREATEST CAPACITY yet developed for mechanical refrigeration applications and assure for the FIRST time:

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Descriptive brochure just off the press—tells you all about this latest Kerotest achievement in Filters and Driers for modern refrigeration.



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PITTSBURGH, PA.

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Detroit, Mich.18273 Santa Rosa Drive Thomas B. McLaughlin		

Cross-Section of Expansion Valve

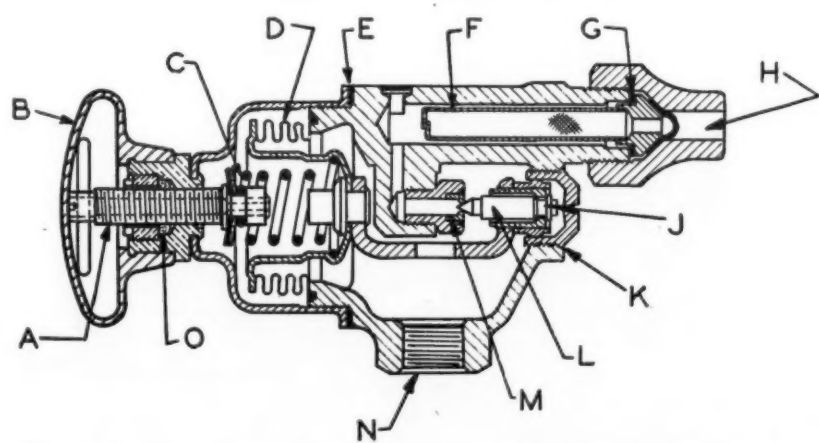


Fig. 1. Cross section of Detroit Lubricator's automatic expansion valve. Lettered parts are as follows: A—Adjusting screw. B—Adjusting screw breather cap. C—Adjusting spring. D—Bellows. E—Moisture tight joint. F—Strainer. G—Copper gasket. H—Inlet connection 1/4-in. copper tube. J—Needle swivel. K—Plug hermetically sealed with solder. L—Stainless steel needle. M—Stainless steel seat. N—Outlet connection. O—Packing.

Expansion Valve & Thermostat Settings Must Be Balanced

(Continued from Page 9, Column 5)

Any fault such as leaking head valves or leaking suction valve might cause long or continuous operation, along with cabinet temperatures that are either too cold or too warm. Furthermore, excess refrigerant, or air in the system which causes excessive head pressure, also reduces the capacity of the compressor unit with resulting long or continuous operation, but here again the cabinet and chilling unit temperature may be either too warm or too cold, or normal depending upon the amount that the capacity has been reduced.

Thermostat and Expansion Valve Setting

The successful operation of the refrigerator depends upon a condition of balance between the expansion valve setting and the thermostat setting. If the expansion valve is set too low, it produces colder temperature in the chilling unit. Should the setting of the valve be excessively low, it would reduce the capacity of the compressor unit due to the low suction pressure and might cause the compressor to run continuously.

At extremely low settings, only a small amount of refrigerant is admitted and the chilling unit would be only partially refrigerated. The cabinet temperature would be quite warm even though the machine operated continuously.

When the expansion valve is adjusted for too high a suction pressure, the temperature of the chilling unit is increased and sometimes this temperature may be above the point at which the thermostat cuts out. In this case the compressor will run continuously, or too long, with cabinet temperature and chilling unit temperature approximately normal.

On the other hand, if the setting is excessively high, the machine will run continuously and the temperature will be too warm. In either case the valve admits too much refrigerant and the excess floods through the suction line.

The balanced condition in the system can also be easily upset by misadjustment or change in the adjustment of the thermostat, thus a low setting on the thermostat tends to make the compressor operate longer and produce colder temperature.

However, if the setting is extremely low, it may be colder than the refrigerant temperature and cause the machine to run continuously, producing excessively cold temperatures in the cabinet along with sweating or frosting of the suction line. If a thermostat setting is too high, the machine will cut out too quick, resulting in warm temperatures.

Test for Leaking Expansion Valve

If the conditions indicate that the expansion valve leaks, it should be thoroughly tested in the shop after removal from the system. This can be easily done by applying pressure to the inlet connection and watching for leaks through the outlet connection

Temperature-Pressure Curve for Refrigerants

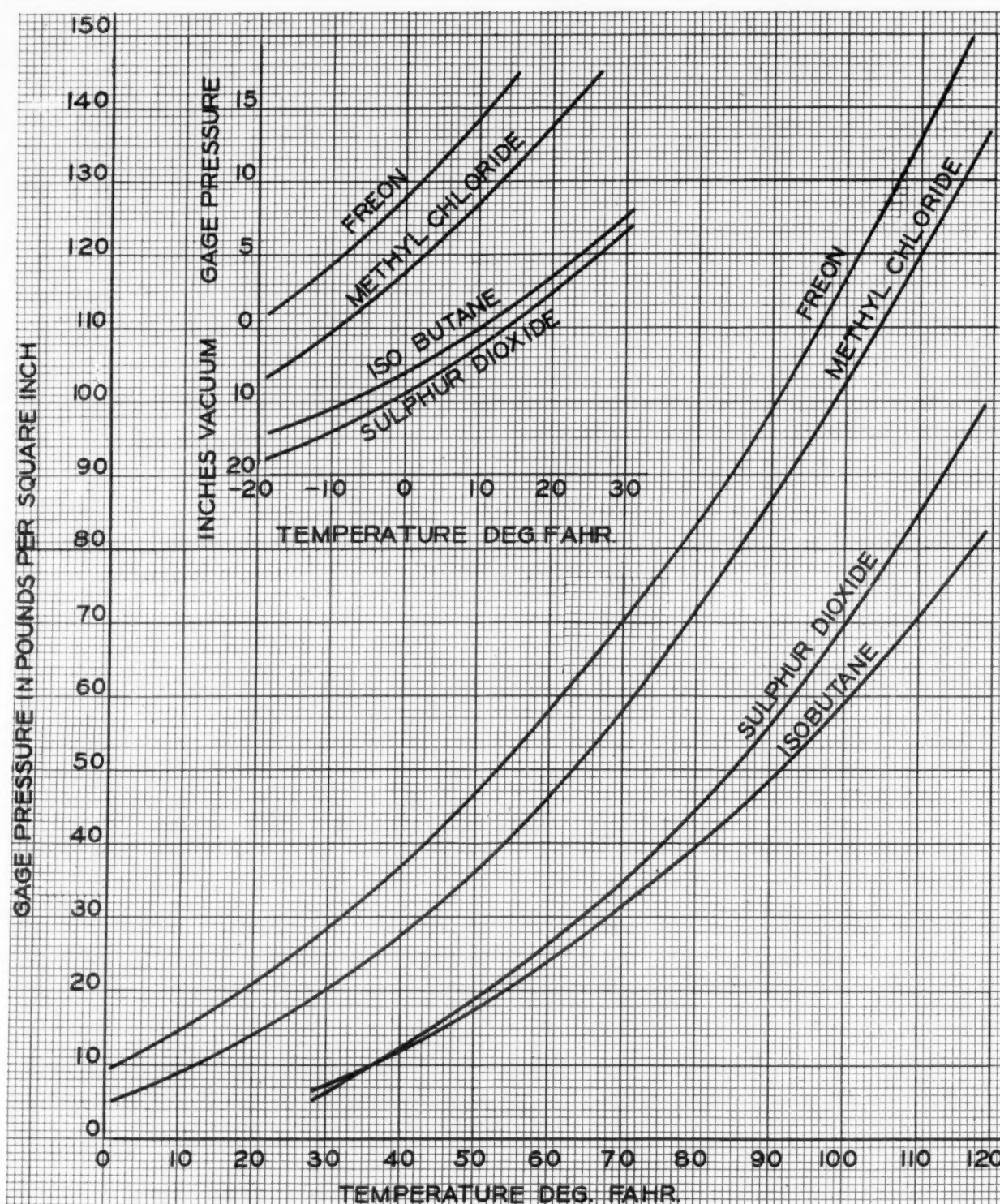


Fig. 4. Temperature-pressure curve for common refrigerants. Note that for better clarity the range just above and below atmospheric pressure is charted in greater detail with a separate insert above.

with the adjusting screw turned all the way out.

The required pressure can be obtained from an air line of 50 to 100 lbs. pressure or simply by connecting a drum of refrigerant to the inlet of the valve so as to obtain gas pressure. The outlet of the valve should be immersed in light oil or kerosene—do not use water.

If the valve flows a stream of

bubbles, it is a sure sign of leakage. Oftentimes the leakage may be caused by dirt or some particle on the needle and can be easily flushed out with a device such as shown in Fig. 3.

Method of Cleaning Expansion Valve

Use a solvent such as gasoline or carbontetrachloride, or any other good cleaning fluid. Best results are obtained by using a container for the solvent which can be connected to an air pressure line. Such a container is shown in Fig. 3. The flushing operation is accomplished by opening the hand valves at the top and bottom of the container and then rapidly turning the adjustment of the expansion valve in and out so as to blow the solvent through the valve intermittently. If flushing the valve fails to correct the leaking condition, it will be necessary to return it to the factory for repairs.

Moisture in System

Moisture in SO_2 refrigerating systems generally attacks the compressor, before it attacks the expansion valve, and may cause the compressor to bind or damage the discharge valve. This generally requires a complete rebuilding of the compressor.

Moisture in systems other than SO_2 generally freezes at the expansion valve with the result that the suction pressure becomes erratic and usually drops to a very low point. A sharp blow on the body of the valve usually corrects the trouble temporarily but almost invariably the moisture will collect again after continued operation.

The safest way to correct moisture trouble is to completely discharge the machine, thoroughly evacuate and recharge with dry refrigerant, and also replace the oil with the correct grade of refrigeration oil that is known to be dry.

For systems other than SO_2 , various types of dryers have been recommended, such as calcium chloride, calcium oxide, silica gel, activated alumina, and methyl alcohol (wood alcohol).

Calcium chloride acts quickly to pick up the moisture but has a severe corrosive action and eventually may attack the needle and seat of the expansion valve, causing leaks.

Calcium oxide has been recommended because it has no corrosive action and is claimed to retard corrosion.

It removes moisture slowly but eventually does a thorough job if sufficient amount is used.

Methyl alcohol has been recommended and used in some cases to combat moisture in methyl chloride, isobutane, or Freon systems. Its action in preventing freezing is instantaneous but the effect on corrosion is not thoroughly known.

Manufacturers of activated alumina and silica gel claim that these materials will absorb considerable moisture without producing any corrosive effects.

Look for Evident Faults

In checking over a unit for service, one of the first things to look for should be tight motor bearings, a binding compressor, and loose belts. This can be so easily done by turning the machinery over by hand, and it should always be attended to on every service call.

A large percentage of complaints arise from poor circulation in the cabinet or poor circulation over the condenser. Inspect the baffle opening and passages to insure that circulation has not been retarded over the chilling unit or through the shelves. Look for paper or oil cloth spread over the shelves which might prevent circulation.

When excessive head pressures are encountered, always check up to insure that the refrigerator is placed in such a position to provide free air circulation over the condenser and also that the hot air is not being recirculated over and over again.

Non-Conventional Units

In the following description of service problems on conventional type refrigerators, many of the suggestions will also apply to rotary or hermetically sealed machines where these machines used the automatic expansion valve.

Some machines do not have connections for a head pressure gauge or a suction pressure gauge, and this type of machine requires special procedure which is usually explained in the manufacturer's service manual. In general, however, much can be done by following the procedure recommended here. In some cases it may be necessary to use a thermometer in order to determine the temperature of the evaporator and of the condenser.

Condenser Pressure

Fig. 4 shows curves for the pressure of refrigerants at various temperatures. These curves will be useful in determining proper suction pressures and condenser pressures.

The condenser dissipates heat to the room air, and therefore it must be warmer than the air by an amount depending on its size and efficiency. Ordinarily condenser temperatures from 10 to 30° above room temperatures are encountered. Therefore, when using the curve in Fig. 4 to determine the proper head pressure, allowance must be made for the elevation of the condenser temperature above the observed room temperature.

Service Chart

In the service chart on the next page, service complaints have been listed in the first three columns. The next five columns show the observations that should be made upon the machine. The next column shows the condition that is probably causing the trouble, and the last column makes reference to the various paragraphs covering special instructions.

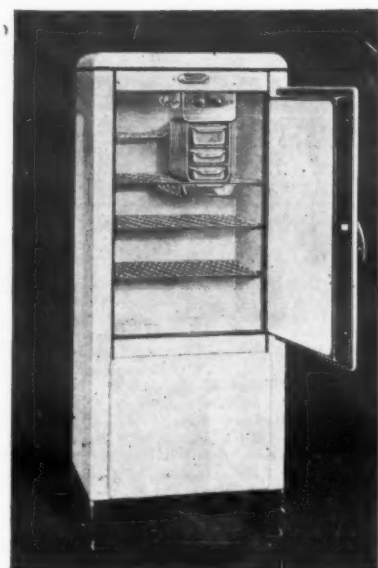
No chart such as this can take the place of common sense and experience, but much help will be obtained by following through the various observations outlined.

When two or more conditions combine to cause trouble, the problem of service becomes still more complicated. It is usually best to eliminate one factor at a time.

Oftentimes the refrigerator will be serviced on several occasions, before

(Concluded on Page 11, Column 1)

Satisfaction



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Container for Cleaning Valves

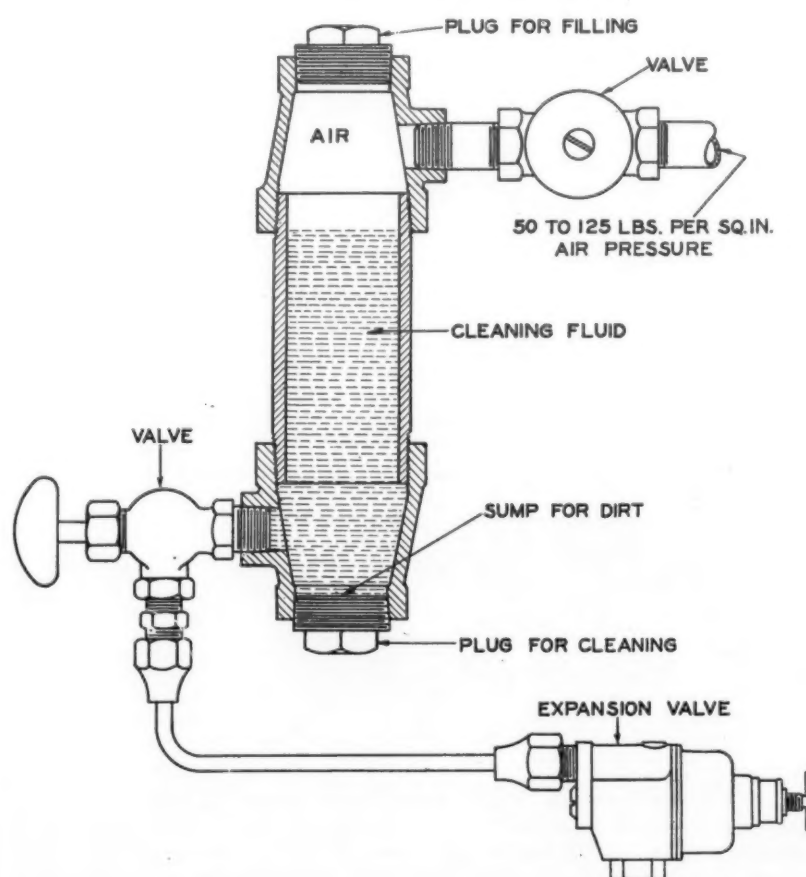


Fig. 3. For flushing out automatic expansion valves, Mr. Wile of Detroit Lubricator suggests this equipment, described in first column to the left.

SERVICE CHART

Conventional Domestic Unit with Automatic Expansion Valve

Complaint			Observations					Probable Trouble	Reference
CABINET TEMPERATURE	CHILLING UNIT TEMPERATURE	RUNNING TIME	SUCTION PRESSURE	SUCTION LINE TEMPERATURE	HEAD PRESSURE	LIQUID LINE TEMPERATURE	MOTOR TEMPERATURE		To Capital Lettered Paragraphs in Text
Warm	Warm	Continuous	Normal	Normal	Low	Warm	Normal	Shortage of Refrigerant	1 A, B, C
Warm	Warm	Continuous	Normal	Normal	Low	Normal	Normal	Leaking Head Valve or Piston Valve	4 A, B, C, 5 A
Warm	Warm	Continuous	Normal	Normal	High	Cool	Overloaded	Excess Refrigerant	2 A, B
Warm	Warm	Continuous	Normal	Normal	High	Warm	Overloaded	Air in System	3 A, B, C,
Warm	Warm	Short Cycles	Normal	Normal	Normal	Normal	Normal	Thermostat Set Too High	10 A, B, C,
Warm	Warm	Continuous	High	Cold	High	Normal	Overloaded	Expansion Valve Set Too High or Leaks	6 A, B, 8 A, B
Warm	Warm	Short Cycles	High	Normal or Cold	Normal	Normal	Normal	Expansion Valve Set Too High	6 A, B,
Warm	Warm	Over Loads Cuts Out	High	Normal	Normal	Normal	Overloaded	Compressor or Motor Bearings Bind	
Warm	Partly Cold	Continuous	Very Low	Normal	Normal or Low	Normal	Normal	Expansion Valve Set Too Low or Frozen or Obstructed Liquid Line	7 A, B, 9 A, B, C, 13 A, B, C, D
Normal or Warm	Normal or Warm	Short Cycles	Normal	Normal or Cold	Normal	Normal	Normal	Expansion Valve Leaks	8 A, B
Warm	Normal	Less than Normal	Normal	Normal	Normal	Normal	Normal	Poor Air Circulation in Cabinet	
Normal	Normal	Short Cycles or Continuous	Normal	Normal or Cold	Normal or Low	Normal	Normal	Head Valve Leaks	4 A, B, C
Normal	Normal	Continuous or Too Long	High	Cold	Normal or High	Normal	Overloaded	Expansion Valve Set Too High	6 A, B
Cold	Cold	Continuous or Too Long	Normal	Normal	Normal or Low	Warm	Normal	Shortage of Refrigerant	2 A, B, C
Cold	Cold	Continuous or Too Long	Normal	Normal	Normal or Low	Normal	Normal	Leaking Head or Piston Valve	4 A, B, C—5 A
Cold	Cold	Continuous or Too Long	Normal	Normal	High	Cool	Overloaded	Excess Refrigerant	2 A, B
Cold	Cold	Continuous or Too Long	Normal	Normal	High	Warm	Overloaded	Air in System	3 A, B, C
Cold	Cold	Continuous or Too Long	Low	Normal	Normal	Normal	Normal	Expansion Valve Set Too Low or Obstructed Liquid Line	7 A, B, 13 A, B, C, D,
Cold	Cold	Continuous or Too Long	Normal	Cold	Normal or High	Normal	Overloaded	Thermostat Set Too Low	11 A, B

Service Chart Aids In Repairing Units

(Concluded from Page 10, Column 5) the actual fault is found. In such a case the expansion valve may be needlessly thrown out of adjustment, the thermostat may be thrown out of adjustment, too much refrigerant added, or air allowed to get into the system. This is a very common experience and causes considerable complication.

Often times a refrigerator may be short of refrigerant, but have air in the system so that from a casual observation of the head pressure it might appear that the machine has an excess amount of refrigerant. By following the procedure in the chart carefully, it would be observed that the liquid line was excessively warm and this would immediately indicate a shortage of refrigerant. After adding more refrigerant, it would then become evident that the system contained air.

Note that an excess of refrigerant shows up in the chart with almost exactly the same symptoms as air in the system. However, the method of correction is the same in both cases; that is, to vent gas out of the shut-off valve at the compressor head.

Complaints

When service is requested, the owner of the refrigerator usually expresses the complaint as one or more of the following items:

1. Machine is noisy.
2. Machine runs too long.
3. Machine won't operate.
4. Machine operates too often.
5. Cabinet is too warm.
6. Cabinet is too cold.
7. Chilling unit collects too much frost.
8. Chilling unit will not freeze cubes.
9. Chilling unit freezes cubes too slow.
10. Chilling unit will not freeze desserts.

It is important to obtain a complete report of the complaint from the user of the box. Find out if the trouble occurred gradually or suddenly. Keep in mind, however, that the average user is not an expert observer and part of the complaint may be due to a sudden consciousness of a noise or characteristic that has always existed and is inherent in the design of the unit.

For instance, there are many refrigerators, especially the newer ones, that operate on comparatively short

cycles. When a tenant who is accustomed to a refrigerator with a brine tank, operating once every hour or more, moves to a house or apartment with a refrigerator operating four or five times an hour, there is likely to be a complaint.

Nothing can be done about it, except to check up to insure that the machine is operating properly and is quiet as possible. Failure to freeze desserts may be due to the recipe used rather than the refrigerator.

References

1. Shortage of Refrigerant

- Effect
- a. Long or continuous operation.
 - b. Warm chilling unit with great shortage, slow ice freezing.
 - c. Normal or cold chilling unit (slight shortage).
 - d. Sometimes causes a hissing noise at expansion valve.

Note: With the automatic expansion valve, shortage of refrigerant may not cause low suction pressure. It usually causes low head pressure.

Detection

- A. Listen for hissing noise at valve with compressor operating.
- B. Check head pressure. Place sheet of paper or cardboard over face of condenser and watch head pressure. With shortage of refrigerant the pressure will not increase rapidly.
- C. Feel liquid line—it will be warm. After blanking face of condenser it will warm up rapidly.

2. Excess Refrigerant

- Effect
- a. Noisy operation (sometimes).
 - b. Long operating time.
 - c. High power consumption.
 - d. Motor overloaded.
 - e. Cold or normal chilling unit with slight excess.
 - f. Warm chilling unit with great excess, slow ice freezing.

Detection

- A. Excessive head pressure.
- B. Condenser will be cold except for small portion near top. This condition will be exaggerated by blanking off face of condenser with a sheet of paper.

3. Air in System

- Effect (Same as excess refrigerant.)
- a. Noisy operation (sometimes).
 - b. Long operating time.
 - c. High power consumption.
 - d. Motor overloaded.
 - e. Cold or normal chilling unit with small amount of air.
 - f. Warm chilling unit with large amount of air.

Detection

- A. Excessive head pressure.
- B. Condenser will be considerably warmer than normal. Also warmer than with excess refrigerant.
- C. Liquid line will be warmer than normal.

4. Leaking Head Valve

- Effect
- a. Long or continuous operation.
 - b. Short cycling.

Detection

- A. Low head pressure.
- B. Head gauge may fluctuate violently.
- C. Stop compressor, shut off discharge valve and if necessary pump up head pressure to about normal. Pressure will fall quickly and fluctuate as compressor is turned over by hand.

Note: Suction pressure may be normal, but pulls down slowly at start of cycle.

5. Leaking Piston Valve

- Effect
- a. Long or continuous operation.
 - b. Cold chilling unit with slight leak.

Detection

- A. Install suction gauge, close suction valve and operate compressor. If piston valve leaks, machine will not pull a good vacuum.
- Note: Most compressors in good condition will pull a 20-in. vacuum against normal head pressure.

6. Expansion Valve Set Too High

- Effect
- a. Noisy operation (refrigerant in crankcase).
 - b. Long or continuous operation.
 - c. Warm box or normal when set only slightly high.
 - d. Slow freezing.
 - e. Sweating or frosting suction line.
 - f. When set only slightly high, machine may short cycle.

Detection

- A. Suction pressure gauge reads high even after the compressor has operated for some time.
- B. When correct pressure is not known. Set cold control (if provided) one point above coldest position. Allow compressor to operate for some time or until thermostat cuts off. Just before thermostat cuts off suction line may frost or sweat. Remedy by turning adjusting screw out slowly (¼ turn at a time) until condition is corrected. Allow time between adjustments for compressor to remove heat from chilling unit. After thermostat cuts off wait until next operating cycle and watch for frost or sweat at

start of run. If this occurs reduce valve setting still further.

Note: Most machines operate at about 5 in. vacuum on SO₂ but this varies for various makes and models. Correct suction pressures from 2 to 10 in. are encountered.

7. Expansion Valve Set Too Low

- Effect
- a. Refrigerator normal or too cold, long running time.
 - b. Chilling unit too warm or partly refrigerated when setting is very low.

Detection

- A. Check suction pressure.
- B. If proper suction pressure is not known set cold control (if provided) one point above coldest setting. Allow machine to operate half hour or until the thermostat cuts out. If thermostat cuts out the valve setting is probably only slightly low. Adjust valve in to raise pressure to correct point (when known) or until cooling unit is completely refrigerated. Adjust slowly, ¼ turn at a time, allowing time for compressor to remove heat from cooling unit. Removing warm ice trays will allow adjustment in shorter time but when correct pressure is not known, this adjustment requires at least a half hour.

8. Expansion Valve Leaks or Stuck Open

- Effect
- a. Noisy operation (refrigerant in crankcase).
 - b. Machine runs too long or short cycles.
 - c. Suction line sweats.

Detection

- A. Allow machine to cycle normally and feel suction line when machine starts. A leaking expansion valve will cause frost or bad sweating at the start of the cycle.
- B. With a stuck open valve the suction pressure will be high after continuous running, and will not respond to adjustment. Remove valve and try flushing out.

9. Moisture in System

Methyl Chloride, Isobutane, or Freon

Effect

- a. Machine operates continuously or too long.
- b. Box too warm.
- c. Slow freezing or defrosts.

Detection

- A. Suction pressure gauge will usually read low but jumps up when valve is given a sharp blow.
- B. Valve does not respond readily to adjustment.
- C. Valve may operate correctly at start of cycle, then suddenly change pressure setting.

10. Thermostat Set Too High

Effect

- a. Box too warm.
- b. Slow freezing.
- c. Chilling unit only partially refrigerated.

Detection

- A. Allow machine to cycle normally and observe if chilling unit is only partially refrigerated at end of cycle.
- B. Use thermometer to determine if food space is really too warm.
- C. Stick thermometer against thermostat bulb with putty (if correct temperature setting is known).

11. Thermostat Set Too Low

Effect

- a. Box too cold.
- b. Machine runs too long or continuous.
- c. Suction line frosts or sweats.

Detection

- A. Check box temperature.
- B. Set cold control (if provided) one point above coldest setting, allow machine to cycle normally and observe suction line at end of cycle.

12. Thermostat Loses Charge

Effect

- a. Machine will not operate.
- Detection
- A. Check through thermostat wiring with test lamp or remove cover. Contacts will not close even when the bulb is warm.

13. Liquid Line Clogged

Effect

- a. Warm cabinet and chilling unit.
- b. Machine runs continuously.

Detection

- A. Liquid line may be frosted due to refrigerant expanding beyond obstruction.
- B. Suction pressure will not respond to adjustment of expansion valve.
- C. Suction pressure may rise rapidly after machine is stopped.
- D. Check expansion valve strainer.

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RADIO INDUSTRY CLAIMS RIGHT TO SELF GOVERNMENT

Conclusion of Arguments for Separate Code

In this issue is published the third and final portion of the text of public hearings held July 23 in Washington, D. C., on the petition of the Radio Manufacturers Association for exemption from the NRA code of fair competition for the electrical manufacturing industry.

First portion of the hearing (published in the Aug. 8 issue of the News) dealt largely with the formal petition of the RMA for exemption, as presented by Bond Geddes, executive vice president of the RMA, and Capt. William Sparks, chairman of the RMA code committee.

Four reasons why radio manufacturers should have a separate code were listed in the RMA petition: (1) that self-government, a cardinal NRA principle, could not be effected in the radio industry so long as it was operating under the electrical code; (2) that independence was precluded for the radio industry if it were necessary for all RMA members to join the National Electrical Manufacturers Association; (3) that efficient and less expensive code administration could be accomplished under a separate code; (4) that the trade practice provisions of the electrical code failed to meet special problems of the radio industry.

Testimony at this hearing tended to indicate how the administration of the electrical manufacturing code has proved unsatisfactory to members of the radio industry, and why its members felt radio was big enough, important enough, and specialized enough to have a code of its own.

In the Aug. 15 issue of the News the answer of Nema (National Electrical Manufacturers Association) to the RMA testimony was reported. Spokesmen for Nema were W. J. Donald and Francis E. Neagle, who picked flaws in the RMA testimony, answered some of the charges against Nema, and ignored others, and assumed a pointedly critical attitude toward the RMA and the manufacturers who had testified.

Mr. Donald set out to show that the electrical industry had fostered and developed the radio industry, that problems of the two industries were comparable and reconcilable, and that Nema was much better fitted to handle code administration than RMA.

Attorney Neagle confined himself more to attacks on the RMA testimony and the RMA itself, making such remarks as that part of the RMA testimony was "unqualifiedly false," and that "the RMA should be utterly and completely ashamed of itself."

Testimony published in this issue—which concludes the report of the hearing—was offered by representatives of various groups related to the industry: distributors, labor, cabinet manufacturers, and others.

(Concluded from Aug. 15 Issue)

Mr. Van Allen: May we have a copy, if that is done, with the privilege of replying to it?

Deputy Cowling: Yes.

Mr. Donald: There are gentlemen here who are familiar with the technical aspects of these different sections of the electrical manufacturing industry, and the relation to radio use of these products. You may want to ask them questions.

Deputy Cowling: We have some more telegrams, and I will ask Mr. Howland to read them into the record.

Stewart-Warner Telegram

Mr. Howland: The two telegrams that I referred to this morning, from Stewart-Warner and from Continental Carbon, Inc., have been sent over, and I will place them in the record as written.

Telegram dated Chicago, July 23, from Stewart-Warner Corp., to Col. J. G. Cowling, Deputy Administrator, NRA:

"As a member of the RMA we desire to withdraw from the electrical code and have an independent code and code authority for the radio industry."

Telegram dated Cleveland, July 23, from Continental Carbon, Inc., to B. W. Murray, Divisional Administrator, NRA:

"We desire to withdraw from the Electrical Code and want an independent code and Code Authority fitted to our

radio industry. The Electrical Code does not function to our immediate needs and problems."

Then we have a telegram from the Rola Co., Cleveland, which states:

"As an active member of the RMA we wish to declare our desire to withdraw from the Electrical code and sincerely urge that an independent code and code authority of the radio industry be instituted."

Then there is one from the Magnavox Co., Ft. Wayne, Ind., which reads:

"As a member of the radio industry and the RMA for many years we respectfully wish to go on record as desiring to withdraw from the electrical code and to see our radio industry code committee secure for us an independent code fitted to the radio industry needs. The Electrical Code has not proven satisfactory and we deem it a matter of urgent need that the NRA give us an opportunity to operate under a code designed and administered by representatives of our industry who thoroughly understand the serious problems confronting us."

Then a telegram from the Smith Insuline Corp. of America, reading:

"As manufacturers of radio parts we are under impression that our interests would be served best if the radio industry withdrew from electrical code and operated under its own code."

John Bradfield, Vice President, International Radio Corp., wires as follows:

"We are desirous of withdrawing from the electrical code and approve the idea of an independent code for radio manufacturers."

A telegram from Benjamin Gross, of New York City, reads:

"As Chairman of Divisional Code Authority Radio Wholesaling Trade I favor granting of radio manufacturers request for exemption from the electrical code on consideration for a separate radio manufacturers code. Our Code Authority will give consideration to the details in such a code when available after preliminary advisory boards conferences so that we may coordinate our effort in behalf of the industry's recovery."

Mr. Donald: May I add one point? I have heard it said that some members who are manufacturers of products which are a radio application of electrical products have found embarrassment in the fact that the electrical code specifies shorter weekly hours than other codes under which they operate. In cases at least I know that the major proportion of the business of some of those companies is in fields other than radio application of electrical products.

It has been the policy of Nema, when such cases have been referred to the Code Authority, to approve and recommend to the Administrator that exemptions from the labor provisions of the Nema code should be granted the companies, the major part of whose business is under some other code, whether it be steel castings or not, because we believe in that principle as it applies, not only to the electrical manufacturing industry and its members, but also to other industries, and in due justice to other companies operating chiefly in other industries we grant those on every occasion.

Deputy Cowling: Mr. John J. Gibson has filed a request for permission to be heard.

Mr. Gibson: No, I did not.

Deputy Cowling: Mr. Henyon, of the General Electric Co.?

Mr. Henyon: I have nothing to say. The brief has been presented.

Deputy Cowling: Mr. Young, of Western Electric.

Mr. Neagle: The gentlemen whose names you are reading are the technical men who are ready to answer any questions.

Deputy Cowling: Mr. B. J. Erskine, President of the Hygrade-Sylvania Co.

(No response.)

Deputy Cowling: Is Mr. Felts here?

(No response.)

Deputy Cowling: Mr. T. E. Savage, President of the Ken-Rad Corp.

(No response.)

Deputy Cowling: Mr. Burlow, do you wish to be heard?

Mr. Burlow: No.

Deputy Cowling: Mr. Davies, of the Incandescent Lamp Manufacturers Association.

Lamp Manufacturers Protest Neagle Remarks

Statement of Mr. Davies, Representing the Incandescent Lamp Manufacturers Association

Mr. Davies: As representing the Incandescent Lamp Manufacturers Association, I just wish to protest the remarks of Judge Neagle in regard to our objections.

Deputy Cowling: Has this anything to do with this exemption?

Mr. Davies: I just wish to make a formal objection on the record against the remarks of Judge Neagle, in which he said we had not objected to the Code Authority when we had our hearing before the NRA.

I think the record will show that we did object.

Deputy Cowling: I do not believe Mr. Davies, that that has a thing to do with what we are discussing.

Mr. Davies: I just wish to correct anything he said this morning.

Deputy Cowling: Mr. Walter Mitchell, Jr., Secretary of the Furniture Code Authority.

Is Mr. Mitchell here?

(No response.)

Deputy Cowling: Mr. Harry C. Kline.

Mr. Kline: I understand that this is just a hearing as to whether there shall be a separate code for the radio industry, and as my remarks would be on labor and on hours, I do not feel that they would be pertinent at this time.

Deputy Cowling: Thank you, sir. Mr. T. Nessler.

Mr. Nessler: I have nothing to offer.

Deputy Cowling: Mr. David M. Trilling, representing the Radio Wholesalers Association.

Why This Report Is Published

For a number of reasons ELECTRIC REFRIGERATION NEWS considers the publication of this report on the hearing of the radio industry's petition for exemption from the NRA code for the electrical manufacturing industry (this issue contains the third and last portion of the report) important and significant.

First of all, the radio and electric refrigeration industries have been marching side-by-side through the last several years. Not only are a number of leading radio manufacturers also engaged in making refrigerators, but to a large extent the distributor-dealer bodies of the two industries are interlocking.

Second, insofar as code affairs are concerned, the electric refrigeration industry is also governed by the National Electrical Manufacturers Association, as is the radio group. Refrigeration manufacturers have not given voice thus far to complaints against the association's administration of the code.

Third, the NEWS feels that this report of NRA procedure should be valuable to business men generally. From reading it they may gain a good idea of the procedure followed by NRA officials in attempting to iron out difficulties arising under the operation of the various codes.

TRILLING

Statement of Mr. David M. Trilling, Representing the Radio Wholesalers Association

Mr. Trilling: Mr. Administrator, my name is David M. Trilling. I am the senior member of the firm of Trilling & Montague, wholesale radio distributors for the past 12 years in Philadelphia.

I am also the president of the Radio Wholesalers Association, which represents the leading wholesalers of radio in this country, and, as such, we represent greater than 75 per cent of the total volume of radio wholesaling in the industry.

I am also vice chairman of the Radio Wholesalers Code Authority.

My affiliations, I feel, with these channels of radio wholesaling serve to indicate how closely I am identified with the radio wholesale trade.

At the recent Chicago convention of radio wholesalers, this past June, there was a strong sentiment among the wholesalers that the radio manufacturers should have a separate code. If the radio manufacturers had their own code, it would then be possible for the wholesale radio code authority to work with the code authority of the Radio Manufacturers for the common good of the problems of our industry, so that there might be some cooperation between wholesaling and manufacturing for promulgating sales programs that would increase business for both manufacturers and wholesalers as well as the dealers.

Mr. Administrator, as an indication of some of the activities that would be of common interest to manufacturers as well as wholesalers and dealers, I would like to present to you a booklet that we have just gotten out, known as the Five Point Plan for Revitalizing the Radio Business, and it tells quite a complete story of some of the things that can be done to increase the radio business so that greater employment can be had in this industry, and the necessity of doing the things that we think will be helpful.

Complex Problems Peculiar to Radio

As radio wholesalers we are in a position to observe that radio manufacturers would make much better progress toward a better understanding of their common problems than is now possible. With one representative on the electrical manufacturers division of the Code Authority, they are not in position to duly represent their problems.

We are certain that certain complex problems that have to do with the distribution of radio merchandise require certain trade practices that are peculiar to the radio industry, and for this reason wholesalers would like to see the radio manufacturers have a code of their own, so that many of the evils that have crept into our industry, traceable to inter-competition among radio manufacturers, might have a reasonable chance of being rectified.

The separate code as now written will go far toward creating a better understanding and feeling of confidence, so that distributors and dealers can get together with manufacturers and put over a radio industry program for increasing business.

As wholesalers, we believe that the operation of a separate code for radio manufacturers will be the turning point in our industry for better times.

Service Obligations

As a member of the radio wholesalers code authority, I cannot help but recall similar objections that Nema made against the proposed exemption for this division, that is, when our code was under consideration as a supplementary code to the general wholesaling code. There all kinds of interests that are somewhat affected because of allied merchandise, but we found, and we have proven to your NRA advisory board, that our industry is peculiar, for in our case we sell merchandise that is not a complete transaction when the purchaser buys something and puts the money down. In other industries, when that purchase is made and the money paid, that transaction is finished, but in our industry that transaction is the beginning of an obligation on the

part of the radio manufacturers, with warranties passed on down through the wholesalers, and from the wholesalers on down to the dealers, to give service to the purchaser or the public until that warranty has been executed. The execution of such warranties requires technical knowledge, which comes from the manufacturers to the wholesalers, and the wholesalers, in turn, pass it on to the dealers, and their service men.

In the event of the inability of the dealers properly to serve the public, we are called upon as wholesalers to help the dealers in this technical information for making proper repairs, and I cite this as an indication why our industry is peculiar, and that it should have fair trade practices that are necessary to this type of industry.

Likewise in the selling of merchandise, we have our peaks, and in these peaks we are out exploiting the value of radio entertainment and whatnot of any individual make of apparatus that a manufacturer or a distributor may be out to exploit. They require special sales drives, special sales promotional activities that must originate with the manufacturer, and the distributor in this case, and as the in-between in such cases, inasmuch as our peaks require a great deal of expenditure of moneys for advertising and promotional activities, most of this expenditure can be lost if the people who have to follow through do not accurately take hold of things and make the most of them.

Therefore, in considering this business and its requirements as needing an entity of its own, and having separate problems, it would be well to consider that there is something in this business that requires a service beyond a sale, and, as such, there are a lot of evils that have crept into this business which have helped in great measure in ruining the total volume of the business that has been generated during the past few years.

Many of the worth while wholesaling outlets have sort of neglected radio, because of the inability of the radio manufacturers to work out these problems so that they could rectify some of the evils that have crept into this business, and it is because of these evils, I believe, that the radio manufacturers are better qualified to know what are the fair trade practices required to operate amongst themselves.

Deputy Cowling: Mr. Trilling, you are familiar with the fact that a supplemental code under the Nema can be submitted by this industry to carry their own fair trade practices?

Mr. Trilling: Yes, sir, I am somewhat familiar with that.

Trilling Cites 5-Year Refrigerator Guarantee

Deputy Cowling: What is there that could not be taken care of, that you know of, in the supplemental code?

Mr. Trilling: Well, I can only cite that I happen to be also in the electrical refrigeration industry, and they had a very big problem among manufacturers as to a five year guarantee. One manufacturer was for it, and every one against it, and finally—and I do not know why they were not enabled to get together, that the majority should not have their opinion pretty well there, but this one manufacturer held out and has a five year guarantee today.

Deputy Cowling: I beg your pardon. If you will read the supplemental code you will find that it is a one-year guarantee.

Mr. Trilling: Then they have modified it so that they can get around the same thing by charging extra, one dollar a year for the next four years. It is another way of getting around the same problem.

Deputy Cowling: But the industry was 100 per cent in agreement on that warranty clause.

Mr. Trilling: I am living in this industry. Mr. Administrator, trying to make a living at it, and a great many other wholesalers are trying to do it, and there seem to be a lot of trade practices that have crept up earlier in this industry that have ruined it, and now we have an opportunity of rectifying that situation, and we think that with the radio manufacturers having their own code, it would operate best in our industry.

Deputy Cowling: Thank you very much. Mr. J. Mitton, president of the Radio & Metal Workers Industrial Union, Winona, N. J.

Union Official Favors Separate Radio Code

Statement of Mr. J. Mitton, President, National Council of Radio and Metal Workers Industrial Union

Mr. Mitton: Mr. Deputy, I have a brief here.

It having been brought to the attention of the Radio & Metal Workers Industrial Union that application has been made by the RMA for, withdrawal or exemption of its members from the existing NRA Code for the Electrical Industry, and, as further set forth in the application, the installation of a separate Code of Fair Competition for the radio industry; and this hearing being brought thereon, we the membership of the Radio & Metal Workers Industrial Union, through Joseph G. Mitton, our chairman and present representative desire to urge the adoption of a separate Code for the Radio Industry. The following reasons are advanced in that behalf.

The Radio Industry is a seasonal one. Production is crowded intensely into six months of the twelve. The resulting unemployment is not considered or provided for by the Electrical Code. The present minimum wages provided, 32 cents hourly, have cheerfully and gratefully accepted by the employers of the Radio Industry as maximum compensation.

The Electrical Code in its unassuming way has settled, finally, the question of Labor's Standard of Living. It has simply done away with it.

The 32 cents hourly rate has been generally adopted by the Employer of the Radio Industry in every district but the Metropolitan Philadelphia Area. In the latter region, through the efforts of organized labor, the R.C.A. Victor, Philco, and Atwater Kent plants, average an hourly rate of 49.5 cents for female work. The average hourly rate of pay for a male is 69 cents. The average weekly wage 31 hours, both male and female is \$19.00. These rates, so much better than the minimum provided for by the code, shriek out the fact that the present code is a downright failure, in so far as labor is concerned. A new wage scale must be set up that will provide, at least, a living wage. The hourly rate cannot be less than 66¢ cents per hour.

Wages shall be for week performed and not based upon the age or sex of the worker. Those performing the same tasks shall be paid the same rates. The present code sets no actual limitation upon the number of hours any plant can operate, inasmuch as, under the code, hour limitations do not apply to branches of industry in which seasonal demand requires longer hours. In such cases the number of hours that may be worked is that "required by the necessities of the situation."

The slack season finds unemployment rate in our ranks. Our living costs necessarily continue. Any code that will not recognize this condition; any code that will not remedy this condition, is a code of fair competition in name only. To spread employment, a 5-day, 30-hour week is necessary, and is herewith demanded.

With no limitations as to the number of working hours per week, there was no provision for a special rate for overtime work. This provision is necessary and must be included in any new code for the Radio Industry.

The present code shows no recognition of labor's right to strike and picket. Any code that fails in this respect is unfair and discriminatory, and we so charge the present code.

To the end that a fair and impartial determination be had of disputes that may arise under any code, we strongly urge labor representation upon the Code Authority. Need we mention that under the Electrical Code such representation is strongly lacking.

In conclusion we feel and our representative here, is hereby authorized to so state, that, if the provisions of the National Industrial Recovery Act namely,

1. Increase of purchasing power of the public.

2. Right of labor to organize into unions of its own choosing.

Are to benefit labor employed in the Radio Industry, then and in that case our proposals incorporated herein must be made an integral part of the proposed code.

This brief is submitted by:

Mr. J. Mitton, president, in behalf of the following organizations:

A. National Council of the Radio & Metal Workers Industrial Union.

1. R.C.A. Victor—Local No. 1 of the R.&M.W.I.U.

2. Radio Condenser, Camden, N. J.—Local No. 2 of the R.&M.W.I.U.

3. Jobbing Shops—Philadelphia, Pa.—Local No. 3 of the R.&M.W.I.U.

4. Atwater Kent—Philadelphia, Pa.—Local No. 4 of the R.&M.W.I.U.

B. Regional Council of New York and Vicinity.

1. R.C.A.—Harrison, N. J.—Local No. 5 of the R.&M.W.I.U.

2. Independent Radio & Metal Workers Union of New York covering the following shops:

a. De Jure Amsco.

b. Pilot.

c. Aerovox.

d. Teleradio.

3. Instrument Workers Union—General Instrument—New York City.

Deputy Cowling: Judge Delaney would like to ask you a question.

Mr. Delaney: In requesting the exemption for the radio manufacturers you are not at the same time supporting the code as they present it?

Mr. Mitton: I do not know what the code is that the radio manufacturers are presenting.

Mr. Delaney: It provides for a 40-hour week, with 48 hours maximum, and 40 cents an hour.

Mr. Mitton: I tried to procure a copy of the proposed code, and I was told that there was no such thing. The brief was purely drawn up with the idea of telling

(Continued on Page 14, Column 1)

WAUKESHA

MOTOR CO., manufacturer of heavy duty internal combustion engines, recently introduced a line of household refrigerators, ice makers, and milk coolers, all powered by gasoline motors. Considerable interest in these products has been created through the company's advertising, prepared by their advertising agency, the Cramer-Krasselt Co. of Milwaukee.

**WAUKESHA MOTOR COMPANY**

MANUFACTURERS OF
HEAVY DUTY INTERNAL COMBUSTION ENGINES
— FOR —
TRUCKS, MOTOR COACHES AND INDUSTRIAL PURPOSES
WAUKESHA, WIS.

EASTERN SALES OFFICE
EIGHT WEST 40TH STREET
NEW YORK CITY
WESTERN SALES OFFICE
635 MISSION STREET
SAN FRANCISCO, CAL.
CABLE ADDRESS: MOTOR
CODE A B C 67 EDITION

July 16, 1934

Electric Refrigeration News,
5229 Cass Avenue,
Detroit, Michigan.

Gentlemen:

You will be interested to know that in a check-up of dealer inquiries among the trade publications we have been using to introduce our line of refrigeration products, "Electric Refrigeration News" tops the list not only in number of inquiries received but also in actual distributor and dealer appointments effected. In other words, more valuable and resultful inquiries were received from your readers than from any of the several other trade publications which we used in our initial advertising campaign.

A striking example of your reader reaction to our line is the case of a northwestern dealer in home appliances who read our first advertisement in your publication on the Sunday following the date of issue. He immediately called his partner to the office and, after discussing the advantages of handling our product, both men drove nearly a thousand miles to Waukesha at night in order to make the first bid for a franchise covering their territory.

We also desire to take this opportunity to thank you for your splendid editorial cooperation in further bringing our equipment to the attention of your enterprise readers.

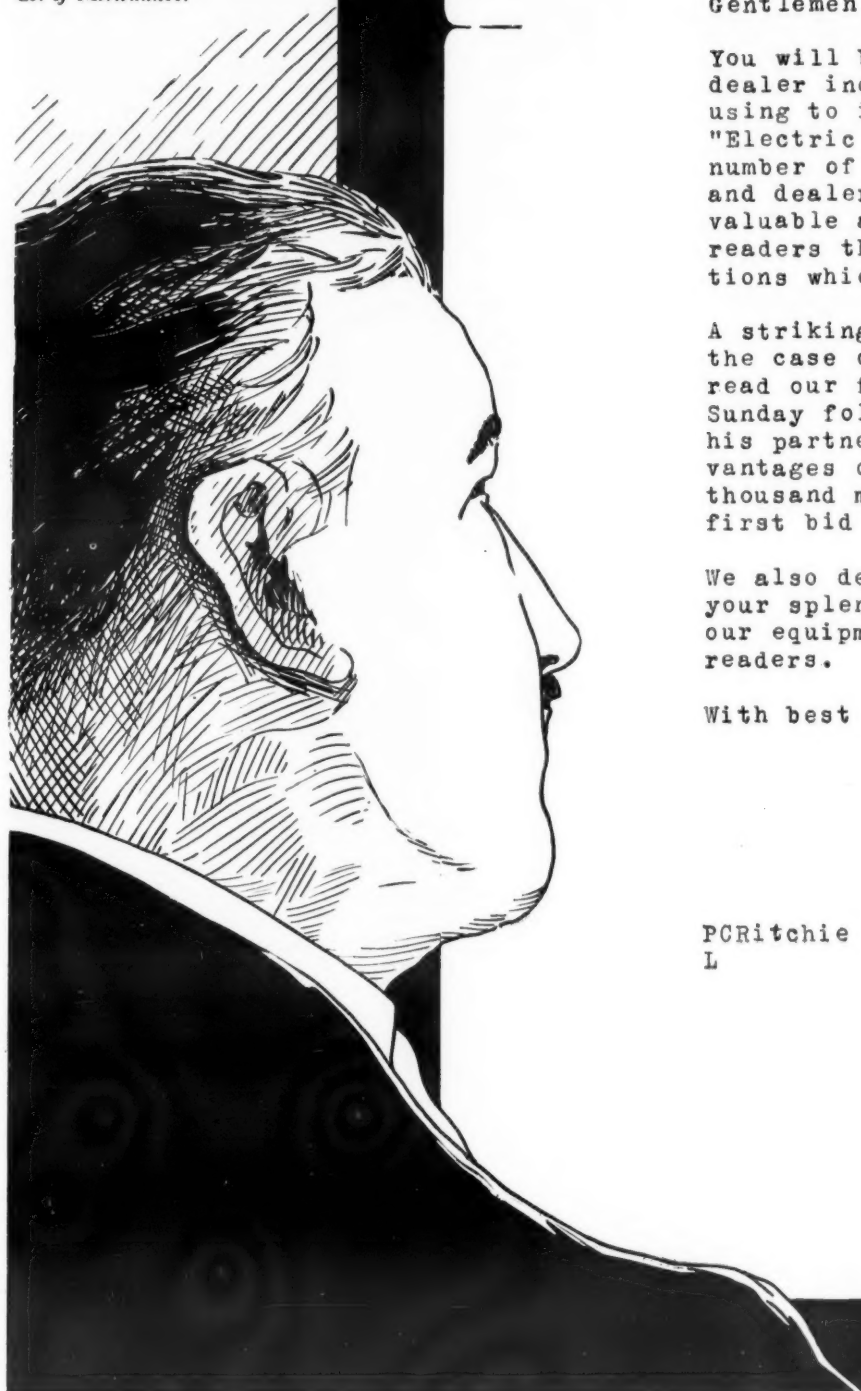
With best wishes for your continued success, I am,

Very truly yours,

WAUKESHA MOTOR COMPANY

Frederick R. Ritchie
Advertising Manager

PCRitchie
L



Another manufacturer finds advertising in the News effective - -

Electric Refrigeration News has a reputation for editorial courage and fairness which gives its readers confidence in what they read in the paper. They not only *read* its advertisements - they *act* upon them. The experience of Waukesha Motor Co. in introducing a new product to the refrigeration industry is a good demonstration of this.

Electric Refrigeration News offers more than an opportunity to get outlets for new merchandise. Many companies have found that consistent use of its advertising columns does much to keep strong and healthy the morale of sales organizations, because it maintains their confidence in the product. Initial advertising *creates* interest; consistent advertising *maintains* it.

ELECTRIC REFRIGERATION NEWS, 5229 Cass Ave., Detroit, Mich.

VAN ALLEN PLEADS FOR DIVORCE FROM NEMA CONTROL

Union Leaders Inject Demand For More Pay

(Continued from Page 12, Column 5)

the government why we would consider a separate code as being more favorable.

Mr. Delaney: Simply because the present features of the present electrical code are not satisfactory?

Mr. Mitton: That is right.

Deputy Cowling: Mr. Samuel Neisen, representing the Independent Radio & Metal Workers Union of Greater New York.

Unions Want Direct Dealing With Employers

Statement of Mr. Samuel Neisen, Representing Independent Radio & Metal Workers Union of Greater New York

Mr. Neisen: I do not want to add much to what Brother Mitton has said, because in our union, the New York Radio Workers Executive Council, we have fully approved the proposals put forward by the Camden Union, and as represented by Mr. Mitton.

I do want to say very definitely that we are in favor of a separate code for the radio industry, but not for the same reasons that the radio manufacturers are interested. We are particularly interested in dealing directly with our employers, and we do not like to deal with everybody under the sun before we do deal with our employers, and for that reason we are interested in a very definite code from the radio manufacturing industry.

Another point that I want to raise is the fact that we want representation on the Code Authority from organized labor, and we disagree with the argument presented that if the radio manufacturers were represented on the code authority, that that would constitute a New England town meeting, and we feel that not only the radio manufacturers should be represented, but labor, particularly should be represented on any code authority and any code that is accepted and that we try to put in operation. When I say representation of labor organizations, I mean bona fide labor organizations. I do not mean company unions. Such a code is not worthy of being lived up to, and is not democratic, and does not represent the workers without representation of labor organizations, and therefore we are here in the interest of labor, and we feel that a separate code for the radio industry would present to us the opportunity of fighting more effectively for the interests of the large number of workers employed in the radio industry, 50,000, as has been stated, and these 50,000 are underpaid.

Thirty-two cents an hour is not a living wage, and we want to propose a higher scale of wages as has been proposed in the recommendations of Mr. Mitton.

I understand that it has been stated that the purpose of the code is to increase the purchasing power of labor, but the present code, with the deflation of the dollar, and with the general rise in the cost of living, has not increased the purchasing power of labor, and a separate code would present to us the opportunity of presenting our demands and arguing for them in a more concrete manner.

At the present time, as has been stated, the hearing is limited to the proposition of a separate code, and the exemption from the present code, and in favor of a separate code, and also for representation from labor organizations, bona fide labor organizations, under the code authority that would be set up.

Deputy Cowling: Thank you very much. Mr. Walter C. Holden.

A. F. of L. Supports Radio Industry

Statement of Mr. Walter C. Holden, American Federation of Labor

Mr. Holden: Mr. Administrator, I have the following statement to present on behalf of the workers in the radio industry affiliated with the American Federation of Labor.

The American Federation of Labor in speaking for the affiliated workers throughout the radio manufacturing industry, fully recognizes the importance of a separate code for this industry. The Code for the Electrical Industry includes by definition:

"The manufacture for sale of electrical apparatus, appliances, material or supplies and such other electrical or allied products as are natural affiliates," which means that a host of dissimilar products, varying from turbines to flat irons and from radios to egg beaters, are all covered by one standard set of trade practices, administrative stipulations and labor provisions.

Certain major divisions such as the Washing and Ironing Machine industry and the Vacuum Cleaner manufacturing industry found that they had individual problems for which individual provisions must be made.

Article XI in the code provides for the grouping of certain employers "for administrative purposes in various subdivisions or product classifications," but no provision has been made whereby any consideration could be given to the labor problems in any one of the principal classifications in this major industry.

The Supplementary Code for the Refrigeration Industry took care of the peculiar problems with regard to the administration which were found to exist in this

branch of the industry, but no cognizance was given to the serious problem which confronts the employees in this highly seasonal work.

In the radio industry, there can be no question but that employers must have adequate opportunity to deal with their particular problems in ways which best fit their needs. Can anyone with a knowledge of factory developments in this industry in the last 10 years, question the need for special labor provisions if the purpose of the Act is to be fulfilled.

Figures furnished by the United States Department of Labor, show that employment in the radio and phonograph industry in May, 1934, approximated the average figure for 1929, while average payrolls in May were only approximately one-half of the average monthly figure for 1929. Employment figures in May of this year, compared very favorably with the pre-depression level, but individual earnings have been drastically cut.

Furthermore, the highly seasonal nature of the work and the extremely low levels to which rates have been in cases reduced, by the intense competition which now prevails, have brought acute distress to thousands of workers in the industry.

In the early 20's, when radio manufacture was in its infancy, operations were conducted on a more or less experimental basis with ample time given for a quality product. With the recent wide-spread adoption of radios as a standard equipment in the Automobile Industry, the drive for lower costs has been intense and the output required from workers at certain times has been almost beyond endurance. New problems which arise through changes in design and changes in technique cannot be adequately handled in fairness to the workers without making separate provisions for them.

Another factor which might well be mentioned at this time is the manufacture of radio cabinets, which presents many problems identical to those encountered through the radio manufacturing industry, but which under the code for the Electrical Industry can not well be included under the provisions for the radio industry. A separate code, therefore, which included the manufacture of radio cabinets would normally cover all parts and accessories and help to bring about a certain stability which is not possible so long as the manufacturing of cabinets is outside the code which covers the radio manufacturing industry.

We have been operating under the code for the electrical industry, and many of the weaknesses in this code have been brought to the attention of the Administration. We now have an opportunity for a separate code, which will provide labor provisions for the radio industry, and will give an opportunity to develop industrial relations for this industry on a basis which will mean a very definite step forward. So long as the radio industry is dominated by an electrical manufacturers association, the development of such a relationship is very severely hampered.

It is our recommendation, therefore, that the radio manufacturing industry be exempted from the Code for the Electrical Industry in order that a new code may be drawn up which will meet the needs of employers and employees. This recommendation, however, is made on the very definite understanding that the labor provisions in the code for the radio manufacturing industry will be no less favorable than those in the Code for the Electrical Industry as revised. The petition of the RMA must not be permitted to serve in any way as a means toward securing less favorable conditions of work in radio manufacturing.

Deputy Cowling: Mr. Holden, are you speaking for the rest of these gentlemen, or shall I call on them?

Mr. Holden: If you will give them an opportunity to speak, I will appreciate it.

Deputy Cowling: Mr. George J. Meyer, Secretary, Radio & Television Workers' Labor Union No. 1368.

Workers' Union Concurs

Statement of Mr. George J. Meyer, Secretary, Radio and Television Workers' Union No. 1368

Mr. Meyer: I would like to concur in Mr. Holden's report, and simply state that labor should have representation on the code. The fact is that under the electrical manufacturers' code, there is no Code Authority. It is entirely in Nema's hands, and we feel that under a separate code we will have some proper representation.

This morning a telegram was read from the Kenrad Corp., stating that they were against the proposed separate code. The fact is that in June, they were granted an exemption from the code, and were granted a 12 1/2 per cent decrease in the rate provided by that code.

Those things would not happen if we were under a separate code, and had some sort of industrial relations.

Deputy Cowling: Mr. Donald M. Scott, chairman of the Arbitration Board.

Mr. Scott: I have nothing further to add.

Deputy Cowling: Mr. Albert Newcomb.

Mr. Newcomb: What I have to say has been covered by the previous speakers.

Deputy Cowling: Mr. Joseph Quinn.

Mr. Quinn: Covered by previous speakers.

Deputy Cowling: I understand that Mr. Walter Mitchell, Jr., secretary of the Furniture Code Authority, is present.

Furniture Men Object

Statement of Mr. Walter Mitchell, Jr., Secretary, Furniture Industry Code Authority

Mr. Mitchell: Mr. Deputy Administrator, I want to put in a preliminary comment at this stage on behalf of those furniture manufacturers who make radio cabinets.

I am speaking of wood radio cabinets, which represent the majority of cabinets, as I understand it, in the medium and higher priced sets.

We are not interested in metal or

plastic composition cabinets in some of the popular priced sets.

We believe that any attempt to divorce a radio manufacturer from the electrical code as such is not perhaps our business, but looking forward to the intention of including radio cabinets in a proposed radio code—you may stop me if I am not speaking to the point at your present hearing, because we will protest again at another hearing on the code as such—is undesirable, in that it would place under the same code the manufacturers of cabinets, and their customers, the manufacturers of the chassis, and in such instances where that has been done, intentionally or inadvertently under the NRA, it has proved very unsatisfactory.

In those instances a code for the radio industry would be dominated by the makers of the chassis and the makers of wood cabinets in subsidiary-owned factories, as is done by some of the larger radio manufacturers.

Because of the past history of transactions in the industry, we feel that that would work distinctly to the disadvantage of the manufacturers making radio cabinets.

We have at the present time the manufacturers of wood radio cabinets under the furniture code, and it has proved very satisfactory, and we have petitions coming before the Code Authority at its next meeting, on the 8th of August, by manufacturers who have verbally represented to me in their meeting that they represent 80 per cent or more of the independently produced wood radio cabinets to come under the furniture code. That was done on their own initiative, and was hurried to action by the fact that the Nema code has ruled that wood radio cabinets do not belong under that code.

Now, we feel that anything which would work to the detriment of furniture manufacturers in such a code as would be proposed is certainly not gratitude or ethically fair in the long run, since the furniture industry as such has done a great deal to develop the radio in the design of cabinets, and fitting cabinets in with the design of other furniture, and so forth, and, with respect, and, so far as the wage rates are concerned, the minimum wage scale in the furniture trade is 30 cents in the South and 34 cents in the North, and the thing looks up rather well with the existing electrical code. There would be no more hardship worked upon the electrical manufacturers who own their cabinet works to operate those cabinet works under the furniture code, but they have one slight difficulty of a single shift limitation under the furniture code, which should be taken care of, either by better planning of seasonal production in the radio industry, which has many times been proposed by engineers in the industry, or by arranging an exemption where needed through the Furniture Code Authority.

That constitutes about all that I have, with one comment about the labor end of it.

I do not want to represent the furniture industry as being antagonistic to organized labor, or collective bargaining. It is not. The furniture industry is looking forward to the new deal with cooperation, and feel that it is well worth while. There is so much gained by the present plan that they are willing to forego the old privilege that they used to have, of doing some things to labor that ought not to have been done, but we do look with some misgivings upon the American Federation of Labor appearing before a hearing like this, advocating a code for the radio industry, in which the union has quite a foothold in the electrical industry, as a means of getting a normal foothold in the furniture factories, which are primarily in the smaller towns, where the workers have come privately to our employers and said, "Why should we pay money to labor headquarters, when we can all club together, and you know what we want, and you are giving us what we want?" They have in effect an informal union in many of those towns, without any violence or suggestion of it, and I should think that is not giving a fair deal for labor, that the object of the Recovery Act is to obtain a fair deal for labor, and not particularly to favor any one labor organization.

Deputy Cowling: Thank you very much. Mr. John W. Van Allen has asked to be heard.

VAN ALLEN

Further Statement of Mr. John W. Van Allen, General Counsel, Radio Manufacturers Association

Mr. Van Allen: Mr. Administrator, and your associates, I think it is exceedingly to be regretted that there has come into this hearing matters too much of a personal nature. It is not my desire nor wish in any manner to emphasize in any way whatsoever any personal controversies that may exist between two associations or two groups of industries.

I would like to bring this hearing back to the three points which I think are the pertinent points of the hearing.

First, we have maintained that radio is a separate and distinct industry, that in that respect we have been recognized by many of the departments of the United States Government, by Congress, and by previous decisions of the NRA when we originally asked for an exemption from the electrical manufacturers' code, and we do not believe that it is warranted or justified in any way for our opponents to refer to us as a "so-called industry." We quite resent that remark.

Now, I take it that an industry is a group of people who are engaged in the same line of endeavor, having similar or identical products, having common interests and having a common product. If that does not constitute an industry, then I am sure I do not know what does.

In that respect, the radio industry completely comes within the definition of men and companies engaged in the manufacture and sale of a common product, through common sources of distribution. As to whether we are truly representa-

tive of such an industry as we have defined, it seems rather strange that that should be questioned at this time. There was no question about that when we first asked for exemption. There is no question about it now, because a comparison of Government figures of those who pay the excise taxes with the roster of our association will completely establish how representative we are of those who are engaged in the sales of radio products that are reported to the United States Government.

It is unfortunate that this question of statistics came in, but I submit to you that our statements were correct, to the effect that we were quoting the volume of retail sales, the information for which was secured from McGraw-Hill, a recognized statistical information source.

The very fact that these statistics are questioned, because somebody else would use some other figures, is only for the purpose, I take it, of more or less confusing your mind as to how large this industry is. We told you that the retail sales were so much, and the other people told you that the sales, based on what the manufacturers got, would be something else.

Now, it is as old as the hills that if anybody wants to be separated from somebody else, that a decent respect for the opinion of mankind compels them to state the reasons why they wish to be separated.

Incompatibility Charged

Now, we have come here asking for a divorce from the electrical manufacturing industry's code. If we could believe that we are such a disgraceful, unreliable, and untrustworthy group as the speakers here would have you to believe, who are trying to retain us, then for the life of us we cannot understand why they are not willing to let us go. Why would a man whose wife is suing him for divorce attempt to keep her from doing it, if they did not get along? We have found incompatibility with the partnership with whom we are associated.

Now, there have been many evidences of the more or less attacks on us as an industry, but let me make this comment for a moment before going into that. Our purpose of including cabinets in our proposed code, if I may mention that, was to clear up a very great misunderstanding and a confusion that exists in that particular field. Some of our manufacturers make their cabinets, some of them have cabinets made for them, and there has been a great deal of confusion, and there has been a great deal of distress in some cases, for the reason that the two cabinets have not walked hand in hand through the production process.

Now, one other thing which I can only think is done to confuse is this, and that is to give a long classification limit and characterization to various things like wires and cables and things of that kind. Those are things which you will consider, and properly so, when we present our code, but anybody at that hearing can state to you whether or not certain things should be included in there, but we want to clear up the confusion that now exists with reference to some of those things. Consequently it is more or less beside the issue here, and is only intended to confuse.

Now, we are a manufacturers' association engaged in the single line of industry. In comparison with the great electrical manufacturing industry, we are infinitesimal. We have, and we have justly so, fears of being controlled by such large aggregations as are made up of that association. We have tried to avoid as much as possible the references to why we have that fear, but the history is replete with cases where there has been public criticism of many lines of endeavor in the electrical field. We do not want to be a part of that, and there is no necessity for us to do so.

It is a part of the nature of human hearts that if they have control of something, they do not desire to release it. Moreover, the tendency always is that if you have some control, to strengthen that control until you absolutely dominate it and have usurped all the powers that anybody else has.

We are here fighting for the life of our industry as a separate and distinct industry in the United States. We are here fighting for the right, as an association to represent those who are engaged in this particular industry. We have found many indications on the part of those who apparently wish to control us, of a desire to get from us such members as we have, and the purpose of the RMA was to meet some of that oppression that was coming to us, and to strengthen our own ranks against total destruction.

RMA Purpose Legitimate

Now, I submit that that purpose of the RMA is a perfectly legitimate and legal way for an association to conduct itself and its functions are to strengthen its position in its industry. All things being equal, there is no oppression in that.

Now, we ask, why is it that our friends do not want us to be a separate industry? I think the inference is plain. I am not going to dwell more on that. We tried it once. It did not work. Nema disbanded its section, and we have up until the time we went under this code operated separately and distinctly from Nema, and let me at this point categorically deny that we have not established our own standards in the radio industry. It is a surprise to us to think that any one would believe that, when we have our engineering department and our own standardization engineers that cooperate with the Institute of Radio Engineers.

Neither is the statement fair that we are just assemblers of products. That will be a surprise to many members of our industry who manufacture a large part of everything that goes into a radio set.

Now, one objection was stated here, that if we had our separate code, it would be a horizontal code. But what is the difference between that and being thrown

in with 159 other sections built on horizontal lines, constituting the organizations known as Nema? What is the difference? If they classify all of the electrical products under a certain classification, and many divisions of that, isn't that a horizontal division? What is there so bad about that? Why is it they are so afraid that we are going to tax the patience of the NRA and cause a lot of trouble in the NRA? We have not done it so far. We have cooperated in everything that the NRA has ever asked us to do, and we went quickly under a code in order to accomplish it.

All of these things, however, tend to confirm in the minds of the radio manufacturers that there is some motive other than sound logic that impels the objection and wishes us to be dominated.

Now, we have somebody on the Code Authority, to be representative of the industry, but neither of those men has the final say. Our own Code Authority has none. That lies wholly within the Board of Governors of Nema, that has the final say in everything. We have none.

Now, we were criticized because we did not join in on the proposed revision that would govern trade practices, and we are accused of having copied. We did copy; that is true; but we copied the NRA trade practice clauses not the Nema clauses, because we considered the NRA much more standardized and the way they happened to coincide with the Nema trade clause provision is because the Federal Trade Commission on two occasions has definitely said what should constitute fair trade practices.

Can't Afford to Belong to Nema

Now, we cannot afford to belong to Nema; we cannot afford to do so, and the only instance that we have that indicates to us what it would cost us to do so is the experience of the tube manufacturers. Now, their estimate because of additional dues for the year ended July 31, 1934, is \$24,000 for 13 companies, and their estimate for the year beginning Aug. 1, 1934, brings that figure to approximately \$35,000.

Now, we cannot afford any such expensive luxury. It is too much for us. The radio business does not exist that will permit us to make any such expenditures.

Now, these are the only costs that we have had occasion to come in contact with, that indicate to us about what is coming to us.

Now, when we did not join in the trade practices, we believed that we were about to file a request for exemption from this code, and we did not want to have a duplicate set of costs imposed on us, and consequently under the peculiar wording of the electrical code with reference to participation in codes, we did not wish any part of it, but we did say to Nema in a letter that we would stand our share and fair and equitable proportion of our cost of administering the radio industry in their code. We did that before we ever applied to you for an exemption. Our reason for asking for the exemption is not based on our entire willingness to pay anything to get a free ride. That is what our opponents would have you believe.

Now, we want to remain as a separate industry. We think we have common problems. We have peculiar problems that I do not think anybody in the industry ever had before. The radio wholesalers and manufacturers can tell you, and we can tell you ourselves, and we think we can solve them, but we should have complete autonomy in doing that.

We ask you, for all of the reasons which we have given you today, to permit us to go our own way and to work out our own destiny, make our own arrangements that will constitute compliance with the NRA. We want to be ourselves, and we do not want great aggregations to be telling us how we should run our association. We do not want great aggregations to tell us, even indirectly and by inference, that we are on the way out as an association. We want our own activities and our own functions carried on in our own way, and we want to save the money we feel sure is bound to be expended if we continue to exist in that association or with an association that we cannot afford.

Now, we did not come here with the purpose of getting into many of those things that have been brought out. We have regretted exceedingly, and I regret that I have to make some of the remarks that I have made, because I had hoped that it would not be necessary.

On the other hand, as a spokesman only, not one directly engaged in the business, I would be remiss in my duty if I did not tell you what fear there was in the hearts of the people that I represent here, and did not tell you the belief that they have and that they cannot exist as a separate industry unless something like this is done, that as things are going, we are facing what we believe to be certain destruction.

Mr. Donald: Mr. Administrator—

Deputy Cowling (interrupting): Just a moment.

Mr. Van Allen, what was the amount of the charge proposed by Nema for servicing the RMA division? \$24,000?

Mr. Van Allen: No. The 13 tube manufacturers went into Nema as the tube section. I say they estimated additional dues for members of that group, for the year ending July 31, and this outside of the regular dues of Nema, of \$24,000, and their estimated amount on Aug. 1, 1934, to 1935, was additional dues of \$35,000, based upon the printed record that was furnished them.

Deputy Cowling: What percentage is that of the dollar volume of the radio manufacturing industry?

Mr. Van Allen: What percentage?

Deputy Cowling: Yes.

Mr. Van Allen: I should have to ask somebody else to answer that question.

Deputy Cowling: I think Mr. Felton might possibly have that.

That is all I have now.

Deputy Cowling: Mr. H. H. Eby.

(Concluded on Page 16, Column 1)

SERVICE

ElectrICE Refrigerators Used A Rotary Gear Pump

Sulphur Dioxide Used in Flooded Type Cooling Unit Fed by High-Side Float Control Valve

FEATURED by a small gear pump which has now gone out of vogue in the design of electric refrigeration compressors, the ElectrICE refrigerator manufactured several years ago by the Belding-Hall Co. in Belding, Mich., used sulphur dioxide as a refrigerant in a flooded type cooling unit with a high-pressure float control valve. The float valve is mounted on the base of the compressor, as is the condenser which is comprised of two helical coils of spiral finned tubing cooled by a four-blade fan on the motor shaft.

A complete description of the system and various service operations in connection with it are given in this week's issue of the News. Next week's issue will give common service troubles of the ElectrICE, with their remedies.

Several models of self-contained ElectrICE refrigerators were built (specifications of these appear in the table below), and in addition the company built quite a range of larger refrigerators for ice or for remote installation of the electric refrigerating machine.

Cabinets were insulated with cork-board. Exterior finishes were lacquer or of wood, and interiors were of porcelain or lacquer.

As a rule, no brine tank was used, but a heavy evaporator made up of cast-iron sections bolted together gave a considerable hold-over refrigeration effect. Cooling units were provided with a suction line valve at the top, and at the bottom a double valve for the liquid line, and a service outlet for charging or discharging the evaporator.

Direct-connected by a flexible coupling to a 1/4-hp., 1,750 r.p.m. motor, the compressor is of the rotary type using two small spirally cut gears. Its rated refrigeration capacity is 125 lbs. of ice melting effect per 24 hours in a room temperature of 85° F.

The gears operated between two metal plates so constructed that the refrigerant gas and the oil are led to and from the gears. A short copper tube leading from the base of the housing to the pump conducts oil to the gears where it is admitted to compress the gas and to form a seal during compression.

The combined oil and compressed gas then go into a triple screened service valve, the 80-mesh bronze wire screen separating the oil from the gas and allowing it to drop to the bottom of the compressor to be used again. The gas is then forced out into the condenser coils.

A pair of spiral air tubes running through the compressor housing is used to cool the oil in the compressor, the cooling fan operating between the condenser and the motor. This feature is intended to remove heat of compression which the oil absorbs from the gas. Fastened to the side of the compressor housing are two oil cocks for checking high and low oil levels.

The drive shaft is sealed by means of a hardened steel collar, rotating with and held to same by means of spring-and-rubber (packing) washer. Face of hardened collar is ground and lapped, sealing against the lapped face of cast-iron gland retainer.

Readily accessible for service operations are an instrument board

mounted in the machine compartment (with a fuse block and the Mercoid thermostat), and the service valve manifold block mounted on the condensing unit base, alongside the compressor. The latter provides connections to either the high or low pressure sides of the system for checking its operation, and for adding or subtracting oil or refrigerant.

Service Manifold

This consists of four valves cast in one block. Two valves farthest from compressor control the passage of low pressure gas from the cooling element to the compressor, and the high pressure liquid from the condenser to the float valve.

Two valves nearest the compressor control a service outlet from the low pressure gas line or high pressure liquid line.

Service outlet used for charging system with oil or gas, taking pressure readings on high or low side of system and charging or discharging system.

The float valve opens and closes a needle valve, at high and low liquid level, by a lever fastened to hollow metal float. It is housed in cast iron housing. At the top of the housing is a cock for purging off permanent gases that collect at this point of system.

The float valve functions to control the refrigerant supply, and reduce pressure of the liquid fed to cooling element.

Special Liquid Line

A small copper tube with restricting element on inside is used between the cooling element and the float valve to prevent the liquid refrigerant from evaporating or boiling before reaching cooling element.

Control

Actuated by pressure from a gas filled bulb placed against the lower part of the cooling element, a thermostatic electric switch is connected in series with the motor circuit. The gas-filled bulb is connected by small copper tube to a metallic bellows that actuates the mercury tube switch in the automatic control.

When the gas in the bulb becomes warm it expands, causing the metallic bellows to expand and tilt the mercury tube switch, which makes the electric circuit. When the gas in the bulb becomes cold, it contracts, thus causing the metallic bellows, which is counter-balanced by a spring, to contract. This causes the mercury tube switch to tilt the opposite way, thus breaking the electric circuit.

A rigid sheet metal box contains fuses which protect motor and automatic control. This is mounted on a narrow wood panel with automatic control as one assembly.

Specifications of Self-Contained ElectrICE Units

Model No.	Storage Capacity (cu. ft.)	Shelf Area (sq. ft.)	Cabinet Height (in.)	Cabinet Width (in.)	Cabinet Depth (in.)	Condenser Cooling	No. of Ice Cubes	Weight of Ice Cubes	Motor Size Hp.
S-5	4 1/2	6 1/2	62	26 1/2	19 1/2	Air	36	3 3/4	1/4
S-6	6	8	62 1/2	26 1/2	22 1/2	Air	48	5 1/4	1/4
S-7	7 1/2	9 1/2	62 1/2	34 1/2	22 1/2	Air	60	6 1/4	1/4
S-9	9	13 1/4	67	34 1/2	22 1/2	Air	60	6 1/4	1/4
S-14	14	22 1/4	67	50 1/2	22 1/2	Air	120	12 1/2	1/4
A	6 1/2	8	60 1/2	37	19	Air	60	6 1/4	1/4
B	5 1/2	8 1/4	64 1/2	29 1/2	19	Air	60	6 1/4	1/4

QUIET AS A MOUSE



Sturdy and slipless, and built to fit, Gilmer refrigerator belts run quietly. No whistles. No groans. No squeaks.

Each belt sleeved and marked for easy identification. TODAY — write for folder, JS-94, that covers complete line of belts for all makes and models. L. H. GILMER COMPANY, Tacony, Phila., Pa.



Specialists in quality belts since 1903

Gilmer

Makers of the World's Best-Known V-Belts

Service Manifold

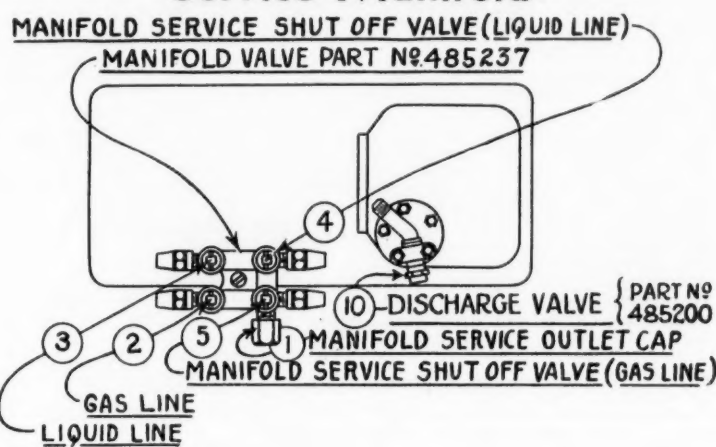


Fig. 1. Four valves cast in one block make a convenient connection for charging or pressure readings. It is mounted alongside the compressor.

Cooling Unit

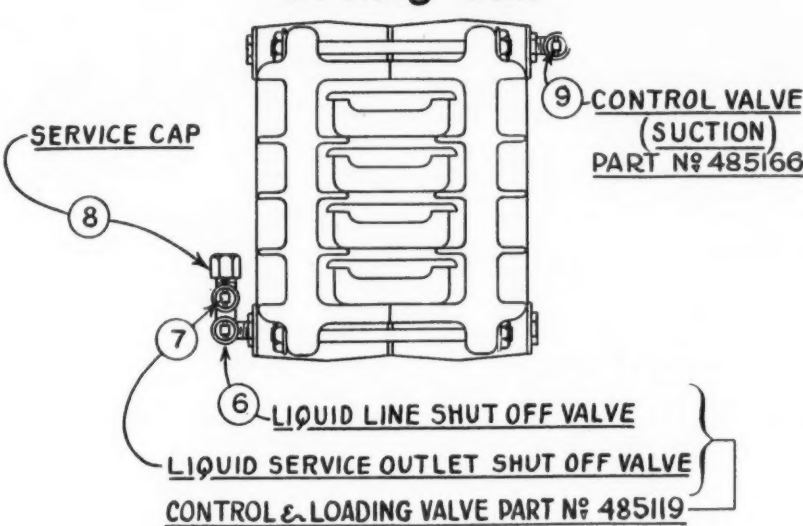


Fig. 2. Cast-iron ElectrICE cooling unit showing suction and liquid valves.

The condensing unit in the self-contained refrigerators is suspended by a strong, durable sash cord. The sash cord is laced through "S" hooks fastened in the hold-down bolt holes of the condensing unit base and the front and rear angle iron cross mem-

Service Instructions Previously Published

This article is one of a series published by Electric Refrigeration News to give the service man help in servicing various makes of machines. Most of the makes described to date have been "orphan" machines on which service information is no longer readily available.

Service instructions on the following makes were published in these issues:

Absopure household.....	March 25, 1931
Majestic hermetic.....	Aug. 16, 1933
Allison.....	May 30 & June 6, 1934
Welsbach.....	June 13, 20, & 27, 1934
Rice household.....	July 4, 1934
Wayne household.....	July 11, 1934
Absopure commercial.....	July 18, 25, & Aug. 1, 1934
Iceberg.....	Aug. 8, 1934
U. S. Hermetic.....	Aug. 15, 1934

ber in the top of the condensing unit compartment. This suspension permits the condensing unit to hang free from any solid contact with the refrigerator.

In remote installations the condensing unit is mounted on adjustable legs which are equipped with rubber tips.

In installing the ElectrICE system, and placing it in operation, open the liquid supply No. 6 (Fig. 1) and gas line shut-off valves No. 9 of the cooling unit (Fig. 2), the discharge shut-off valve No. 10 at top of the compressor, and the two shut-off valves of the service manifold Nos. 2 and 3 farthest from the compressor. The other two valves, Nos. 4 and 5 of the service manifold must be kept closed.

To open the valves mentioned, first remove the seal nut, then turn the stem out until it is tight against the top seat that prevents leakage of gas past the packing. Replace the thin copper washer and seal nut when through.

Oil motor bearings, filling the oil cup on either end with a good grade of light motor oil.

Place the baffle on the cooling element by means of the screws and nuts furnished. See that it lines up with the door opening, also that the door on the ice cube compartment is free to swing without interference. There should be rubber washers under the knurled nuts, at front of baffle to prevent chipping the enamel.

After the system has operated for fifteen minutes or so, remove the service outlet cap, at the service manifold, No. 1 and take a reading of the head pressure, by attaching the

gauge and opening the liquid line service outlet valve No. 4 only.

The pressure at a room temperature of 75° F. should be approximately 50 lbs. gauge, the pressure rising somewhat proportionately with the rising of the room temperature.

Should the head pressure be considerably higher than that mentioned above, open the small purging cock, on top of the float valve housing, thereby releasing any permanent gases from the system and consequently lowering the high head pressure.

The automatic control should be set to keep the refrigerator at approximately 42° to 50° F. Should the temperature vary several degrees either way from this temperature range, adjust the automatic control as per the instructions below under "Automatic Control Adjustment."

Method of Locating Leaks

A bad leak is easily detected by the odor of the sulphur dioxide. The small leaks are detected with an ammonia-saturated swab which may be made by fastening a small sponge or rag on the end of a wire holder.

When the sulphur dioxide gas comes in contact with ammonia fumes, there is a chemical reaction set up, which causes a whitish smoke, similar to that of a cigarette, to form.

If any ammonia water from the swab comes in contact with the copper tubing or brass parts of the system, it should be immediately wiped off, otherwise, it will cause a chemical reaction, thus badly tarnishing the parts affected.

Purging an Installation Line

Let a small amount of gas pass through the tubing, thus driving out the air. Do not let any more gas escape than is absolutely necessary, as the odor is very disagreeable.

Adding Sulphur Dioxide To the System

Remove service outlet cap No. 1 (Fig. 1) at the service manifold. Purge charging tube fastened to sulphur dioxide container by slightly opening and closing valve on same. Fasten charging tube to service outlet No. 1.

Close gas line shut-off valve No. 2 and open gas line service outlet shut-off valve No. 5. This will permit drawing the sulphur dioxide from the container only.

Start operation of condensing unit. The sulphur dioxide container will soon start to frost up on the outside—this is evidence that the gas is being drawn from the container. The frost will extend to the top of the liquid level in the sulphur dioxide container under ordinary conditions.

Be sure and stand the container in an upright position so that the gas is drawn from the top of the container only.

Experience gained, from noting the time required, and watching the frost melt away as the liquid level descends in the container, will enable one to tell how much sulphur dioxide has entered the system. When the necessary amount of sulphur dioxide has entered the system, close the valve on the container.

Stop operation of the machine. Close the gas line service shut-off valve No. 5 and open the gas line shut-off valve No. 2. Remove the tube from the service outlet No. 1 and replace service outlet cap.

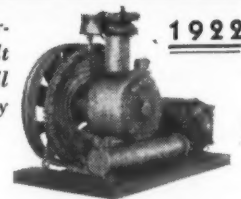
Start operation of the machine again and note whether enough sulphur dioxide has been added; if not, repeat the same procedure.

Discharging Sulphur Dioxide From the System

A discharging tube can be made in the following manner: Take a piece of 1/4-in. copper tubing approximately 6 in. long and flare one end, slip on a 1/4-in. flare tube nut and on the other end of the tube attach a 12-ft. length of 1/4-in. inside diameter rubber tubing. The rubber tube is fastened by twisting a wire around the outside where it slips over the copper tube and then taped to prevent leaking. This tube is used when small amounts of gas are to be discharged, such as an excess charge or when the full charge is questionable as to its purity, with regards moisture, etc.

A tube of this length will permit discharging the sulphur dioxide at a considerable distance from the unit, (Concluded on Page 17, Column 1)

The First Curtis Unit Built in 1922 Still Operates Today



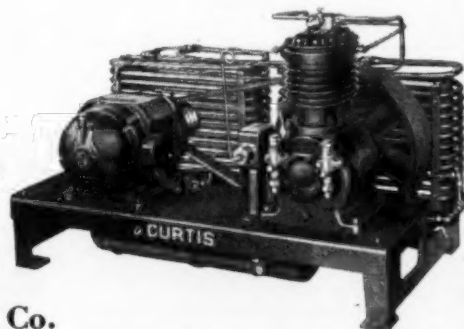
80 Years of Manufacturing Experience

40 Years of Compressor Building

12 Years' Experience in Producing Refrigerating Units

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1/2 to 2 h.p. air cooled
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Division of Curtis Manufacturing Co.
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518 H Hudson Terminal, New York City.

Some desirable territories still open for reliable distributors. Write for details.

Objections to 36-Hour Week Of Nema Code

(Concluded from Page 14, Column 5)

Statement of Mr. H. H. Eby
On Behalf of H. H. Eby, Inc.,
Philadelphia, Pa.

Mr. Eby: My name is H. H. Eby of H. H. Eby, Inc., Philadelphia.

Mr. Administrator and other members of the Board, I happen to be one of the founders of the RMA. I was one of its original directors and I served on that Board for six or seven years. I served as a member of the Membership Committee, being chairman of the Membership Committee for a like period. I feel in some respects like a mother who has raised a large family. I have grown up with this industry for 15 years. I know plenty of the ills and, by the same token, I know plenty about what we have as an industry—and not a so-called industry—contributed to America and to mankind generally.

I know of the selfishness on the part of the men who have played a large and important part in the development of the radio industry. I know what I personally have done in so far as contributing hours of time unselfishly to a cause that I believed in. I know what has been done by other members of the present Board and Boards of recent years.

I attended a meeting in Chicago recently, on June 13, at which time the directors of our association presented a new code to the membership, and, while the membership has dwindled considerably here of late, due to the national causes, I was amazed to find, but very glad to know, that there was not a dissenting voice among our membership to this proposed code.

There are only a few of our membership represented here today, it is true, but I feel, knowing the members of the association as I do, and as I have for 15 years, that they by their absence are paying tribute to their representatives here today.

I know also, because I have kept in close touch with the association, how the average member feels today about the radio industry. I know how they feel about our present setup. I know, practically to a man, that is, the executives and the heads of the various companies who are members, that they want to continue as members in the RMA and they want the RMA to continue, or wish to be a separate group from the electrical industry, feeling that they will be unhampered in their future developments, movements and contributions and that because they have developed and contributed much in the past, by the same token they feel they can contribute much in the future.

I had prepared on my own volition a rather lengthy statement to present to this Board today, but upon reaching Washington last night and contacting some of the members of the Board, I do not happen to be on the Board today—I found that 99 per cent of all the things that I had felt and thought with respect to the withdrawal of the RMA from the electrical code had been covered by the memorandum or statement that has been presented today. I, therefore, have nothing to add other than to bring a message to you gentlemen of the Board as to how I personally know the members of this association are thinking today, and, after all, you really want to get the cross-section of our industry, you want to know what they are thinking, you want to know whether our men, our representatives here, are truly representing our industry and not a selfish view.

I can say in all sincerity, including our counsel here, who has been exceedingly busy, that I know that the things that he has presented, the argument that has been advanced by Captain Sparks, the chairman of our group, that those men are constantly feeling the pulse of our industry and know how our membership is thinking.

It is that particular thought and only that thought that I felt I could leave with you because I feel that we have covered our case rather clearly and definitely in our statement today.

Deputy Cowling: Thank you, Mr. E. J. Ellig of the Crosley Radio Co.?

Crosley Radio Co. Supports Application

Statement of Mr. E. J. Ellig
On Behalf of the Crosley Radio Co.

Mr. Ellig: Mr. Administrator, in the absence of Mr. Crosley, I merely wanted to put the Crosley Radio Corp. on record as supporting the application of the RMA for a separate code for the radio industry.

Deputy Cowling: All right, thank you, Captain Sparks?

Mr. Sparks: Yes sir.

Deputy Cowling: To what extent did the labor provisions of the electrical manufacturing code induce the members of the RMA to withdraw from the basic electrical code?

Mr. Sparks: You are talking about the 36 hours, and so forth?

Deputy Cowling: Yes.

SPARKS

Mr. Sparks: As I cited this morning, out of something over 400 codes that have been granted, I think there are 35 or less that come under the Nema hourly rates.

Now, it stands to reason that when we are trying to compete with other industries who have a 40-hour week, with 36 hours, we just simply cannot compete for that dollar.

That same thing applies—take my own plants as an example—we are operating under the Nema code and we are operating under the automotive parts code. We use the same machines in a great many instances for similar work, and we have got a problem in front of us in

stating that these operators over here can only work 36 hours and this group over there can work 40. The 36-hour operators want the 40-hour week, they want to be on the same basis as their pals who are working beside them.

Primarily one of the most important things is that we cannot meet the competition of other industries who have more favorable labor conditions.

Deputy Cowling: Captain Sparks, I would like to ask you a few more questions, if you do not mind. You are an old manufacturer of radios and parts?

Mr. Sparks: How do you mean that "old?" (Laughter.)

Deputy Cowling: What percentage of the RMA members produce electrical parts or equipment not used exclusively for radio receiving sets, would you say?

Mr. Sparks: Mr. Muter can answer that better because he is a manufacturer of parts.

Mr. Muter: Let me have that again?

Deputy Cowling: What percentage of RMA members produce electrical parts or equipment not used exclusively for radio receiving sets?

Mr. Muter: The best I could give on that would be a guess, but I would say that probably 50 per cent of the manufacturers do produce some parts, whether it be a major or minor of their business, for some outside industry. That is only a guess.

Deputy Cowling: I wonder if you could submit to the Administration a letter on that?

Mr. Muter: We could find out very definitely.

Deputy Cowling: I think it would be very interesting to have that. Captain Sparks, you can probably tell us this: Can you tell us briefly those parts and products now used in radio which were developed and devised primarily for use in radio sets, which, because of possible other inventions are now being used generally?

Mr. Sparks: I would say the outstanding one would be tubes, because without tubes the radio sets never would have come into existence, and especially does that apply since the AC tubes came into existence. It was cited here that tubes are being used for other purposes. They are. They are being used frequently in what is known as thyatron controls for lighting controls and elevator controls, self-leveling and other things, but they were never used before until they were invented and brought into being through the radio industry.

Deputy Cowling: I want to ask you something else. You have a very substantial peak in your industry at times. Has anything ever been done by the RMA to try to level that peak out?

Mr. Sparks: Yes, we have got a great many headaches over that, Colonel. Nothing would suit us better than to be able to level it out, but it seems impossible to do it.

We did away with the show this year. There was a little headache this morning that this organization was brought into being to make a show business out of the radio industry as a racket. That is far from the truth. We did away with the trade show this year, which ordinarily comes in June, at which time the manufacturers have been showing their products, the new models, and the theory was advanced by several manufacturers that that stopped business, that the wholesalers from whom you have heard, and the retailers, immediately, well, say, in March, began to stop buying because they were going to wait for the new models which would come out in June. So, this year we did away with the show entirely to see if there was any truth to that statement. I have not found that it was so.

We do have a peak selling season—there isn't any selling any more; it is a peak buying season, when the people are in the mood, which will run ordinarily from Sept. 1 until the 24th day of December, and it chaps off just like black and white.

Now, we all have attempted in the industry to show some new models, so called, which are possibly new only to the extent of the overcoat, along in January and February, with the hope of getting people to continue to buy, but it is just simply urging something on, and we have an awful hard time.

You can take it right now that from Sept. 1 to Dec. 24, you can say is the selling season.

That has been helped out somewhat during the past year by automobile radios. We have been able to educate the public that they can ride and listen at the same time. It is hoped that before the end of this year perhaps 700,000 automobile radios may be sold. We hope so.

But there seems to be no way out of this peak season as far as radio is concerned.

This year all manufacturers are bringing out, or a good many have their samples already out and others will have them out within the next 30 days or less—we are bringing out what is known as all-wave, or selected wave reception, the idea being to get you gentlemen that do not know very much about it fishing out to get something else you have never heard before, and we hope you will spend your money with us doing so. A great many sets that will come out this year, I will say 75 per cent of them, will have the all-wave reception, and we have been trying to see if we could not get some business this summer and then continue into the fall and go on with it.

Deputy Cowling: It is not possible, then, to stock up on account of the engineering changes?

Mr. Sparks: Yes. You used to be in the automobile business and it changed faster than that. Anybody who has anything left over from last year, or maybe prior to these all-wave sets that are being put on the market very rapidly, is just out of luck, it is just too bad.

Deputy Cowling: Has the Philco company been able to accomplish anything with their advertising on leveling off?

Mr. Sparks: Let us call on Mr. Deming. He is here.

Mr. George B. Deming (Philco company): What is the question?

Deputy Cowling: Have you been able to accomplish anything on this leveling off by your advertising campaign?

Mr. Deming: To some slight degree, but I would say along the line of automobile radio. We have helped to fill in the valley that occurs in the spring with automobile

radio, and we hope that in succeeding years that will help to fill it in.

We have not been able to accomplish the thing which we would like to do of getting the home radio season to spread throughout the year. The problem is, of course, part of ours, largely ours, but is very largely that of the consumer. We are trying to do that with the consumer, and so far I cannot see that we have had any great degree of success. We feel the automobile radio has been more than responsible for our being able to maintain some degree of stability than the home radio.

Deputy Cowling: You are a very large manufacturer of radio; we have not heard any expression from you about this code; do you wish to say anything?

Mr. Deming: We feel that we are in entire agreement with the remainder of the industry in asking for exemption from the electrical code.

Mr. Sparks: Mr. Trilling left here a pamphlet which is entitled "The Five Point Plan," just to give you an idea how desperately we are trying to save this industry. That is a five point plan which has been worked out whereby it is hoped that the manufacturer and wholesaler and the dealer will go into this plan whereby the manufacturer contributes so much per cent, the wholesaler contributes so much per cent, and the dealer contributes so much per cent, by which we hope to raise something over \$1,000,000 for general advertising of the industry.

That is what is now being contemplated and which is being worked on and it is hoped through that, that something may come out. But, the buying public has been in a very peculiar mood for going on four years now. They do not know whether to spend that dollar or whether to hang on to it. You know, it is only worth 50 cents anyhow, so you do not get much.

So, there is the argument we are all in, and we, as a manufacturer in that industry, are doing our best to get part of that dollar that we have to compete with our friendly enemies now in Nema for, and we want to be out fighting for ourselves. Are there any other questions?

Deputy Cowling: Thank you, Mr. Geddes. I am a little concerned about this money involved in this thing. Can you tell me how much money it costs the radio manufacturers to be in the RMA now?

Mr. Geddes: Yes.

Deputy Cowling: How much more it would cost to be under Nema?

Mr. Geddes: Our annual dues last year, Colonel, were about \$45,000 from our members. We have very little information on the cost of Nema dues other than what our tube members have felt under their new set-up as a section of Nema. Based on that, we estimate that the minimum cost for our members, not the industry, but for our present members, would be at least \$100,000 and possibly \$150,000, and, as the Judge says, we cannot afford it. We feel we can give you better administration and a better job with our own Authority.

Deputy Cowling: That would be the difference between \$45,000 at the present as against \$100,000 or \$150,000?

Mr. Geddes: Yes sir.

Deputy Cowling: That is all, thank you, Mr. Geddes. Might I add, Colonel, that of the costs of code operation and code expenses in connection with our agreement to pay Nema a fair and equitable amount, we have borne the entire cost of the supervisory agencies' work since last September, by our association. That explains our reference to the fact that no RMA member has been assessed anything, neither has it cost Nema anything for the operation of radio manufacturers under the code other than the printed forms that they have sent to us. We have borne the rest of the entire expense.

Deputy Cowling: Mr. A. T. Murray, will you speak on the supervisory agencies?

Mr. A. T. Murray: I just want to say a word or two, Mr. Administrator, to clear up the record on one point. It is not terribly important, but I do not want to be a partner to it.

This morning it was stated that last fall at a meeting at which Mr. Muter and myself were present at Nema, we offered \$25,000 to Nema as paying a fair cost for the administration of our code.

At luncheon I asked Mr. Muter if he had any such recollection of a definite figure, that I had none, and he said he had none.

We did say we did want to pay whatever the fair cost was. Whether or not some figures were discussed, I cannot recall, but certainly we, both of us, feel sure there was no definite figure set down.

I do want to say this, in fairness to Nema, that while we have been a stepchild, they have been courteous, they have given us fine cooperation, and I could not in honesty say that there was anything they could have done if we had been paying \$50,000 that they did not do when we were paying nothing.

I, for one, nine months ago was rather in favor of trying to get a group of the men, substantial members of the radio industry, to go into Nema and form a group or section as the Nema code provides. I was in the minority.

After nine months I am just as convinced that it will not work, the industry just does not want it. The industry does want RMA and wants it badly, and from my own experience I am convinced beyond any reasonable doubt that the only way to permit the industry to continue as an entity is to give it a code of its own.

I think this is important for the record, after nine months' experience; you can administer the code for the entire set end of the industry at a cost per year not exceeding \$5,000. If anybody spent any more it is rank extravagance and there is no necessity for it. I have done that job myself for nine months, for half that money, and we have not had any complaints, and I think the industry would say it had been reasonably well done. So, there isn't any high cost necessary for the administration of the code for the set end of this industry. You understand I am not now attempting to speak for the parts.

Deputy Cowling: Thank you very much, Mr. Murray. Mr. Donald, did you want to be heard again?

Mr. Donald: Mr. Administrator, Judge Neagle has some points to raise regarding the expense question and also regarding the nature of the radio industry.

Mr. Neagle: Mr. Deputy Administrator,

first with regard to the expense, I do not know where these figures with regard to expense have come from, because they are not borne out in any way by the facts.

During the year beginning Sept. 1, 1933, which was 15 days after the code for the electrical industry went into effect, and ending on the 1st day of September, this year, the total expense of administering the electrical manufacturing code for the entire industry, leaving out radio receiving sets and television sets for home use and radio parts and accessories, which supervisory agencies' expenses have not been met by Nema, it will be approximately \$300,000, which is, unless my guess is wrong, 1/20 of 1 per cent on the sales of the members of Nema. Those sales are approximately \$600,000,000.

It is estimated that for the year beginning Sept. 1, 1934, the average cost to members of Nema for all the services which Nema renders, which includes many other things than code administration, the average cost will be \$1.00 per 1,000 of sales. That figure will vary with regard to different classifications under the present proposed schedule of dues, because the services rendered in connection with code administration and in connection with other Nema services vary depending upon the branch of the industry affected.

For instance, the cost of administering the code in so far as turbo-generators is concerned, is practically nothing. The cost of administering the wire and cable subdivision of Nema, which includes 18 different groups making different classes of wire products, would be rather large.

It is our estimate that in some sections of Nema the cost to members by way of dues, and the dues will include all code administration expenses, will be as low as 50 cents per \$1,000 of sales, and in no instance will it exceed \$4.50 per \$1,000 of sales.

I submit that an association whose members, not the total industry, because the total electrical industry today is approximately \$550,000,000—in saying that Nema has in its membership a production of \$600,000,000 I am erring on the side of too little and not too much, and for an industry of that size to carry on the job of code administration that it has carried on at a cost of \$300,000 is something that in my opinion you will not find bettered by any code operated under NRA, you will not find any other code where the expense of code administration has been so little.

Now, with particular reference to the radio receiving and tube situation, it was made clear in answer to a question of yours that this expense was beyond the dues which the radio receiving and tube section paid to Nema. As a matter of fact, if the total cost of the radio receiving and tube section were \$35,000 a year, their sales in the year ending June 30, 1933, were \$16,000,000, and the charge would be approximately 1/4 of 1 per cent, which is not high for code administration.

Now, what the gentlemen are talking about is not code administration in any way; that is not correct. It is partly code administration and partly not. What the radio receiving set and tube section had in mind was the hiring of an executive secretary to do the trade practice and trade promotion work. That secretary was also to act as secretary of the supervisory agency for the radio receiving set and tube section, because in the beginning Nema did not feel that it could say definitely that the dues charged to its members would cover code administration. No one knew what code administration would cost and to be on the safe side the Board of Governors of Nema set up a table of dues. They also notified the different products classifications that particular expenses attributable to the particular supervisory agency or a particular product classification would not be borne by them.

Subsequently, in the month of April of this year, I think, having had experience with code operation and code administration, it became apparent that the dues of the association as such were sufficient to pay for all expenses of code administration, including the expenses of supervisory agencies which formerly they had been told they would have to bear, and the association as such, out of its treasury, out of the money paid to it by members as dues, has assumed and has paid and will pay during this final year, every expense of any supervisory agency. So, there has not been in the industry any assessment of any kind in addition to the dues because of the operation of the code.

But, there is just one more thing which to me seems rather fundamental. The application is before the Administration for an exemption from the provisions of the electrical manufacturing code by the radio industry. There is not in the record nor in the application nor in the statement which was read or in the letter of Mr. Geddes to General Johnson, or in the statement read this morning by Captain Sparks a definition of what the industry is.

It is true that in the code, or the proposed code, to which I referred this morning, there is a definition of the industry, but that definition is not in the record here.

Consequently, in our treatment of the situation we have taken up one by one each part in the radio receiving set except the cabinets. As to the cabinets we have said nothing, but we have taken up specifically the component parts of a radio set, and the record shows that the RMA is not in any way representative of the manufacturers of the parts which go to make up a radio set.

On the contrary, Nema in its different sections, and the names have been presented here, is representative of the manufacturer of the parts which go to make up radio sets.

Mr. Van Allen: Mr. Deputy Administrator, on that last point may I speak for a moment?

Deputy Cowling: Yes.

Mr. Van Allen: On the last point we admit that the Board here is not so stupid as not to know what Atwater Kent makes, what Captain Sparks makes, and what Crosley Radio makes, and what RCA-Victor makes. I do not think there is anything substantial in that last point.

Now, may I call our attention to Exhibit 19 submitted in our statement this morning, which substantiates a statement that I made to you, being a copy of the

minutes of the tube section of Nema. The total dues for the 13 members for the fiscal year ending Aug. 31, 1934, were \$25,359.50; dues paid to date, \$17,137.75. That is Exhibit 19.

Deputy Cowling: Mr. Van Allen, I do not know that I can quite agree with your contention. Your petition seeks for an exemption from a code and yet the only way in which it is covered as a definition is in the proposed code which is not actually a part of your petition for exemption. I would suggest that perhaps it might be determined for the benefit of the record if the record does not show that so it may clarify this situation. You are asking in your proposed code to cover the industry in a manner in which it is not covered in the electrical manufacturing industry code?

Mr. Sparks: Would it clarify it still better if we gave you what products are manufactured by those making this application?

Deputy Cowling: I am not telling you what to do.

Mr. Sparks: I am just asking you if it would be clearer to you.

Deputy Cowling: I think it should be clarified.

Mr. Sparks: Yes, we will do it for you, sir. We will be very glad to, if we understand exactly what you want, as to what we think constitutes the radio industry.

Deputy Cowling: Judge Neagle, may I ask you a few questions? If RMA becomes a subdivision of Nema, what degree of autonomy could be given them?

Mr. Neagle: What degree of autonomy would be given them?

Deputy Cowling: Yes.

Mr. Neagle: There is no provision in the constitution and by-laws of Nema to take into it associations. Membership in the association is either corporations or firms or individuals. It has no method by which it provides for membership by association.

But, a section of Nema is in large part autonomous. It is, of course, subject to the Board of Directors, subject to the rules and constitution and by-laws of the organization and working rules, but it operates largely as a separate trade association subject only to the constitution and by-laws and general policies of the association.

That is, the actions taken by any section are not required to be approved by the Board of Governors. The Board of Governors has the power to set aside by a two-thirds vote of all the members any action taken by a section which is contrary to the constitution or by-laws. In effect, each section has autonomy.

Deputy Cowling: Does any one else wish to be heard?

Mr. Neagle: I might say in that connection, Mr. Deputy Administrator, any committee appointed for the radio receiving set for home use division and for the radio accessories division, the supervisory agencies, were selected by RMA. That does not look very much like autocracy or despotism.

Deputy Cowling: Does any one else wish to be heard?

Mr. Brunson: Mr. Donald, I want to ask you a question: In your brief you made the statement that products groups made for autonomy. I would like to know what kind of group autonomy the products groups may have.

Mr. Donald: I am going to ask Judge Neagle, if I may, to answer the question in detail. In general I would say they could have any autonomy not including anything in violation of the law.

Mr. Brunson: (1), may they have a supervisory committee other than that acceptable to the Board of Governors of Nema?

Mr. Donald: The code provides that the supervisory agency shall be appointed by the Code Authority.

Mr. Neagle: Appointed or approved?

Mr. Brunson: I beg pardon. I have not found "Code Authority" anywhere in the code, and that brings another question: In your brief where you refer to Code Authority, do you intend to refer to the Executive Committee of Nema or the Board of Governors of Nema? I am mixed on that.

Mr. Donald: When you refer to Code Authority, technically speaking, it is Nema, as the code is written. The governing party is the Board of Governors. Between the meetings of the Board of Governors that means the Executive Committee, which means about 50 per cent of the Board of Governors.

Mr. Brunson: That Board of Governors is synonymous with the Executive Committee?

Mr. Donald: Not exactly; not identical.

Mr. Brunson: It is the position that the code creates the designated agency, Nema or the association, as the governing body of the industry?

Mr. Donald: The code makes Nema the Code Authority, although that term, as you say, is not included in the code. In effect that means their elected governing body, which is the Board of Governors. The revisions, when approved, make a different provision as to that. This was the fourth code signed before some of the standardized practices obtained.

Mr. Brunson: Answering my question, the code, I take it, does not create any supervisory agency or any Code Authority?

Mr. Donald: The code does not?

Mr. Brunson: I take it that way.

Mr. Donald: It provides for an agency to administer the code.

Mr. Brunson: "With a view to keeping the President of the United States and the Administrator informed as to observance and non-observance, as to whether the electrical manufacturing industry is taking appropriate steps to effect in all respects the policies of the NRA, each employer shall—" and so forth.

Mr. Neagle: Read the first paragraph of 5, Mr. Brunson.

Mr. Donald: "Nema is hereby designated the agency for administering, supervising, and promoting the performance of the provisions of this code by the members of the electrical manufacturing industry." I think that is comparable to other similar early codes.

Mr. Brunson: It goes on to explain—that is all.

Deputy Cowling: If no one else wishes to be heard, the public hearing on the application of the RMA is now recessed, subject to being reconvened by the Administrator.

How to Discharge SO-2 from System

(Concluded from Page 15, Column 5)

preferably out of a window to the outdoors.

In case the gas is to be discharged outdoors, bear in mind that sulphur dioxide is harmful to plant life, small animals, and very disagreeable to human beings. It will also cause metals to rust or tarnish if the gas comes in contact with them.

To discharge the sulphur dioxide, proceed as follows: Remove the porcelain baffle from cooling element. Remove the service outlet cap No. 8 from service outlet valve at the bottom of cooling element.

If the sulphur dioxide is to be discarded, attach the rubber discharging tube to the service outlet. Place other end of discharging tube outdoors or

Higham and Deissler Furnished Data

Thanks are due W. W. Higham, designing engineer of Universal Cooler Corp., and to V. G. Deissler, president of the Deissler Machine Co., Greenville, Pa., for the information published herewith on the ElectrICE refrigerator.

Mr. Higham was connected with the Belding-Hall Co., manufacturer of the ElectrICE, in the capacity of refrigerating engineer several years ago.

Mr. Deissler has furnished information and service parts for the ElectrICE machine since its manufacturer discontinued it, and is still prepared to furnish most replacement parts needed for the ElectrICE.

in a pail of solution (water and lye). One pound of lye neutralizes approximately 1 lb. of sulphur dioxide.

Do not open the service outlet valve No. 7 (Fig. 2 on page 15) too far as the liquid will come out violently, causing the solution to splash out of the pail. If the sulphur dioxide is to be saved, connect an empty drum to the service outlet No. 8 by means of a copper tube. The drum should be placed below the level of the cooling element and in a pail of very cold water, preferably ice water.

The reason for this is that the sulphur dioxide will flow to the coldest container. To speed up this procedure, heat the cooling element and installation lines with hot cloth applications or with a blow torch if it is used moderately and carefully.

The procedure just mentioned will only discharge the sulphur dioxide in the cooling element and the liquid and gas lines. The sulphur dioxide confined in the compressor, condenser coils, and the float valve is discharged from the service outlet No. 1 at the service manifold.

When the necessary amount of sulphur dioxide is discharged from the system as the case may be, close the

Operating Cycle of ElectrICE

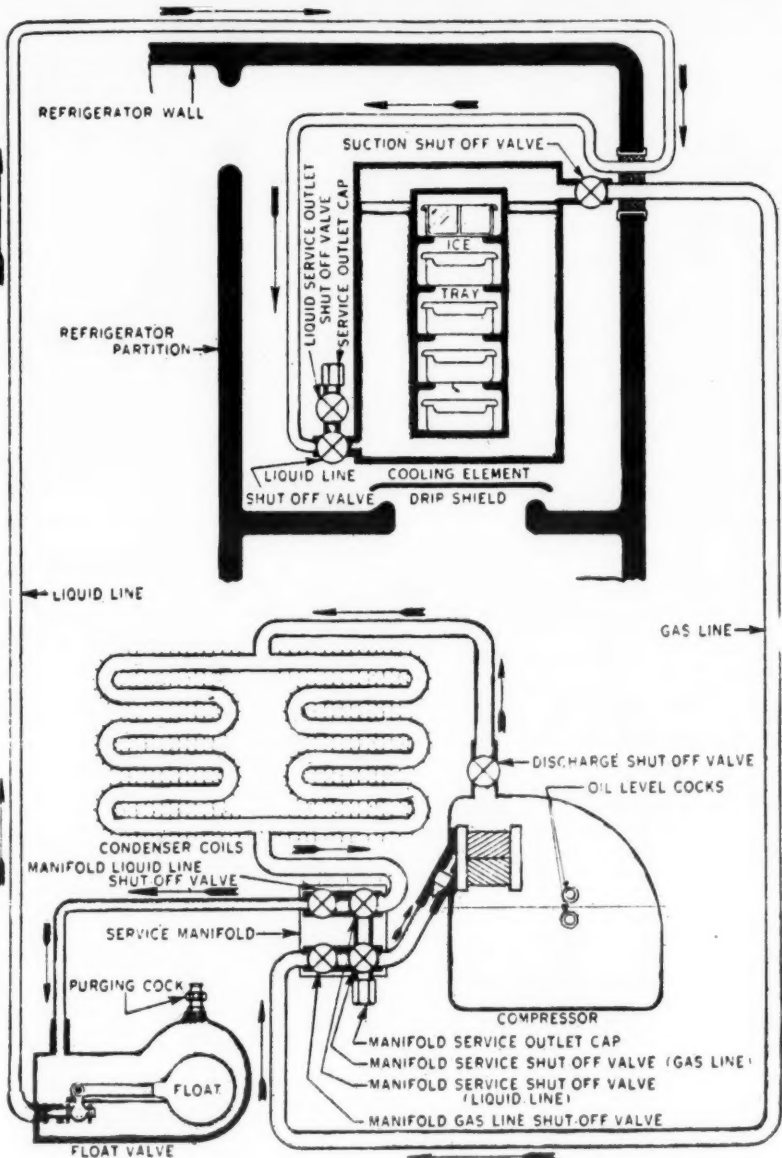


Fig. 3. ElectrICE operating cycle, service of which is described below.

service outlet valve Nos. 7 or 5 and replace outlet cap at Nos. 8 or 1 (Figs. 1 and 2 on page 15).

If the sulphur dioxide has been discharged in a pail of solution, be sure and empty the solution directly into the sewer, as it is liable to attack the plumbing and fixtures, if emptied elsewhere.

Adding Oil to the System

Remove the service outlet cap No. 1 at the service manifold, and attach a short length of clean, dry, 1/4-in. copper tubing. Place free end in a container of clean dry refrigeration compressor oil. Be sure that the oil is free of air bubbles.

Start operation of the machine. This will cause the oil to be drawn into the compressor. Be sure that the end of

the tubing is 2 in. below the level of the oil. Close gas line shut-off valve No. 2 and open the gas line service outlet shut-off valve No. 5.

Under no circumstances allow any air to enter the system. When the desired amount has entered the compressor, close the gas line service outlet shut-off valve No. 5 and stop operation of the machine. Remove short length of copper tube and replace service outlet cap No. 1. Open gas line shut-off valve No. 2.

Open the top cock on the side of the compressor. If the oil has reached this level, drain it off until gas has issued forth. If the oil is below the lower cock on the side of the compressor, more oil must be added.

Purging Permanent Gases From the System

Any permanent gases which may be present in the system, will collect in the top of the float valve housing. To relieve the system of these gases, open the purging cock located in the top of the float valve housing for a moment only.

Reading High and Low Pressures

A standard gauge, indicating the pressure above atmosphere in pounds pressure, is used for high pressure readings.

A compound pressure and vacuum gauge, indicating pressure above atmosphere in pounds pressure and the pressure below atmosphere in inches of vacuum, is used for low side pressure readings.

Remove the service outlet cap No. 1 (see Fig. 1) at the service manifold and attach, by its tube, either gauge as the case may be. For high (head) pressure readings, open the liquid line service outlet shut-off valve No. 4. For low (suction) pressure readings, open the gas line service outlet shut-off valve No. 5.

Only one valve, either gas or liquid line, must be open at one time, the other valve remaining closed. When the pressures are read, close the service outlet valve which has been in use, either No. 4 or 5. Remove the gauge tube and replace the service outlet cap.

A diagnosis of common service troubles on the ElectrICE will be published in next week's issue of the News, together with the recommended remedies.

N. Y. Firm Makes Patching Cement for Porcelain Boxes

NEW YORK CITY—For patching porcelain refrigerator cabinets, the Tilette Cement Co. of this city has brought out a "Liquid Porcelain Glaze." The material is applied with a soft brush, one coat at a time, until the cavity in the porcelain is re-built. The refrigerator can be used 10 hours after a patching job, but the patch should not be tested for hardness for several days. Denatured alcohol is recommended for removing the surplus glaze.

Many Stations Use Despatch Ovens

MINNEAPOLIS—Despatch Oven Co. here recently announced two new dehydrating ovens for use in refrigeration service shops. Designated as model C-5 and C-10, the ovens hold one and two units, respectively, and are priced at \$48 and up, according to H. L. Grapp, vice president. The ovens are made at the factory in lots of 50 at a time.

Included among present users of Despatch type C ovens are the following:

Majestic Household Utilities Corp., Chicago; D. T. Lansing, Inc., Scranton; National Armature & Electric Works, Bluefield, W. Va.; Puro Filter Corp. of America, New York City; Gibson Electric Refrigerator Corp., Greenville, Mich.; Strong, Carlisle & Hammond, Cleveland; Norge Corp., Detroit; Thompson & Holmes, Ltd., San Francisco; Trilling & Montague, Philadelphia.

Standard Refrigerator Co., Fond du Lac, Wis.; Jensen Byrd Co., Spokane; Crosley Radio Corp., Cincinnati; Central Auto Equipment Co., Springfield, Ill.; Otis Hidden Co., Louisville, Ky.; Frigidaire Corp., Dayton; Ashley Ice Cream Co., Charleston, S. C.; Refrigerator Supply Co., San Juan, Porto Rico; Government of Philippine Islands, Bureau of Insular Affairs.

U. S. Marine, Quantico, Va.; Cabell Electric Co., Jackson, Miss.; Edward P. Greig Co., Springfield, Ill.; Columbia Wholesalers, Inc., Baltimore; Jordan Electric Mfg. Co., Minneapolis; St. Louis Crystal Water & Soda Co., St. Louis; A. Y. McDonald Co., Dubuque, Iowa; Patterson Dental Supply Co., Minneapolis; Sunbeam Electric Co., Evansville, Ind.

Moore & Stewart, Inc., Easton, N. C.; University of Minnesota, highway department, Minneapolis; Tatrol, L. West Union, Iowa; Frigidaire Corp., New York City; Frankelite Co., Cleveland; Hoekstra Ice Cream Co., Grand Rapids, Mich.; Georgia Power Co., Atlanta; Benike & Culver, Madison, Wis.; Unger & Watson, Inc., Los Angeles; Harry Alter Co., Chicago.

Roycraft Corp., Minneapolis; Radio Equipment Co. of Dallas, Tex.; Pierce-Phelps, Philadelphia; Woodhouse Electric Co., Norfolk, Va.; Specialty Service Corp., Brooklyn; North Ward Radio Co., Inc., Newark; Inter-mountain Majestic Co., Denver; Harbour-Longmire Co., Oklahoma City; Hieb Radio Supply Co., Des Moines; Radio Equipment Co., South Bend, Ind.

Hamburg Bros., Pittsburgh; Capital Electric Co., Indianapolis; Majestic Distributing Co. of Cleveland, Cleveland; Sterling Radio Co., Kansas City, Mo.; Cooper Louisville Co., Louisville, Ky.; Majestic Distributing Co., Cincinnati; Radio Sales Co., Memphis; Genwood-Linze Co., St. Louis; Southern Hardware & Bicycle Co., Jacksonville, Fla.

Eisenbrandt Radio Co., Baltimore; Shaw's, Inc., Charlotte, N. C.; Badger Radio Co., Milwaukee; Majestic Distributing Co., Seattle; Majestic Distributors, Inc., Boston; Forbes Radio & Refrigerator Co., Birmingham; Kimball-Upson Co., Sacramento, Calif.; Air-Ola Radio Co., Huntington, W. Va.; Capital Electric Co., Atlanta; United Electric Supply Co., Salt Lake City.

Majestic Distributing Co., Tampa, Fla.; Detroit Electric Co., Detroit; Majestic Wholesalers, Inc., Buffalo; R. S. Prouditt Co., Lincoln, Nebr.; Trestrail Corp., Montreal, Canada; Revor Distributors, Inc., Rochester, N. Y.; Revor Distributors, Inc., Syracuse.

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cuse, N. Y.; Modern Appliance Co., New Orleans; and Caterpillar Tractor Co., Minneapolis.

M & E Refrigeration Accessory Company Issues Catalog

PHILADELPHIA—Packed with highly detailed information on the many lines of refrigeration parts and supplies the organization handles is a catalog, "Refrigeration Accessories," prepared by the M&E Refrigeration Accessories Co. here for distribution among prospective buyers of such equipment.

Made up largely of data sheets issued by manufacturers of the products offered, the book is divided by M&E into five principal sections—tools; valves and fittings; expansion valves; controls; and belts, coils, etc.

In the first section are descriptions, specifications, and prices of a variety of Imperial tools, U. S. gauges, Weisker pocket thermometers, Henry tools and Dehydra-Tectors, Wagner motors, Tag thermometers, Pedrick piston rings, Turner gas leak detectors, and a number of other products coming under this general classification.

Section No. 2, that on valves and fittings, is given over mainly to presentation of the Mueller line of angle valves, compressor valves, double-backed operating valves, flare nuts and fittings, line strainers, manifolds, scale traps, shut-off valves, and Streamline fittings. Data is also given on solderless compression couplings made by E. Edelmann & Co.

Three makes of expansion valves are sold by M&E and are described in detail in the catalog's third section. First comes the Aminco automatic expansion valve, then a well-prepared presentation of Genuine Detroit automatic and thermostatic valves, followed by information on Mayson automatic valves.

A number of makes of controls are offered by this wholesaler and have a place in the "control" section of the book, all covered by informative descriptions. They include:

Tag Snapon temperature and pressure controllers and water circulating valves; Genuine Detroit temperature and pressure control switches, solenoid valves, and mercoide controls; Minneapolis-Honeywell Airswitches, mercury switches, temperature and pressure controls; Penn pressure and temperature controls, magnet switches, high pressure and safety cutouts, water regulators, and room thermostats; and Mueller two-temperature control snap valves.

Final section of the catalog contains specifications and prices on DeVilbiss beer pumps, Gilmer belts for refrigeration units, Flexo trays, CFM draft coolers, and Larkin coils.



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ElectrICE Wiring Diagram

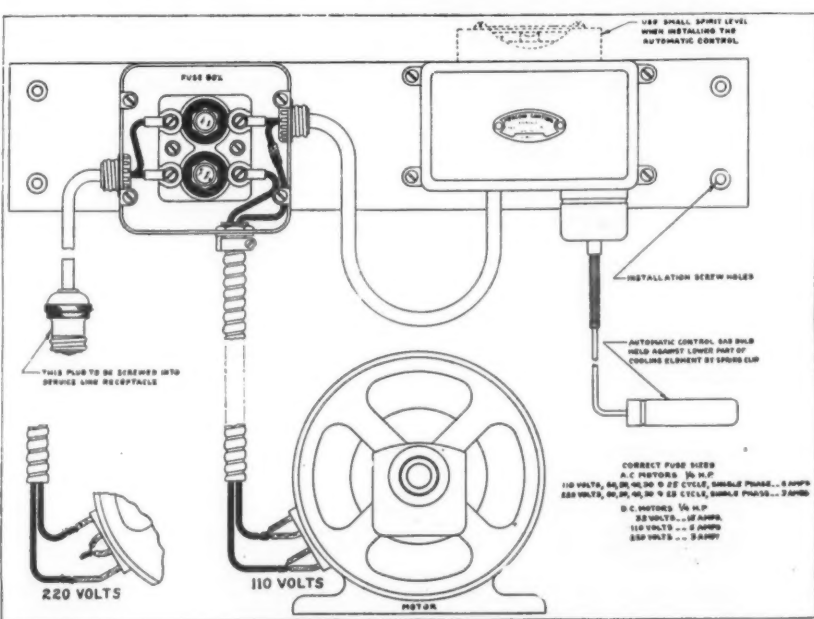


Fig. 4. Arrangement and connections for electrical parts in the ElectrICE.

KRAMER KX CASE EVAPORATORS

2 3/4 in. x 7 in. fin size — 8 Tubes, 1 3/4 in. centers; and 2 3/4 in. x 10 1/2 in. — 12 Tubes — any specified fin spacing and length and in special widths. All copper, hot tinned.

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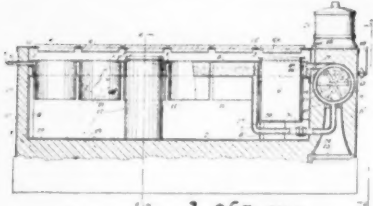
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PATENTS

Issued Aug. 7, 1934

1,968,812. APPARATUS FOR FREEZING MATERIALS AND STORING AND DISPENSING FROZEN PRODUCTS. Michael H. Ackerman, Mansfield, Ohio. Application April 21, 1932. Serial No. 606,631. 16 Claims. (Cl. 62-114.)

1. In apparatus of the class described, the combination of an insulated casing forming an elongated chamber adapted to



1,968,812

contain rows of containers filled with refrigerated products, a circulation means for a volatile liquid refrigerant in said chamber disposed in relation to the upper end portions of said containers and spaced from the bottom of said chamber, a supply connection into said circulation means for the liquid refrigerant, means for controlling the supply of the liquid refrigerant through said connection, and an outlet from said circulation means.

1,968,813. APPARATUS FOR STORING AND DISPENSING PRODUCTS. Michael H. Ackerman, Mansfield, Ohio. Application Jan. 3, 1933. Serial No. 649,888. 13 Claims. (Cl. 62-126.)

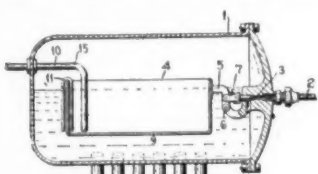
8. An evaporator comprising a plurality of spaced parallel members extending horizontally and each comprising walls shaped to provide in cross section a relatively narrow, vertically elongated cavity extending longitudinally throughout its length and adapted to be partially filled with a volatile liquid refrigerant, liquid refrigerant connections between the lower portions of said members, and gas connections between the upper portions of said members.

1,968,908. REFRIGERATION. Frank D. Peltier and Clyde E. Ploeger, Evansville, Ind., assignors to Servel, Inc., New York, N. Y., a corporation of Delaware. Application Nov. 20, 1930. Serial No. 496,888. 3 Claims. (Cl. 62-126.)

1. In a refrigerating system of the compression type, an evaporator of the flooded type, means for maintaining a substantially constant liquid level within said evaporator, a vapor suction line extending into said evaporator above the normal liquid level therein, the end of said vapor suction line within the evaporator being enlarged, and a wick extended directly into the enlarged portion of said vapor suction line and depending below the normal liquid level in said evaporator.

1,968,909. REFRIGERATION. Clyde E. Ploeger and Frank D. Peltier, Evansville, Ind., assignors to Servel, Inc., New York, N. Y., a corporation of Delaware. Application Sept. 27, 1930. Serial No. 484,746. 4 Claims. (Cl. 62-126.)

1. In a refrigerating system, an expansion chamber including a header, a refrigerant inlet conduit, a control valve in said



1,968,909

conduit, an open top hollow float responsive to the liquid level in said expansion chamber for operating said control valve, a vapor outlet conduit extending into said chamber and terminating within said float, and a wick extending from within said float to a point below the normal liquid level in said expansion chamber.

1,969,102. REFRIGERANT CONTROL FOR REFRIGERATING SYSTEMS. Francis Shenton and Milton W. Garland, Waynesboro, Pa., assignors to Frick Co., Waynesboro, Pa., a corporation of Pennsylvania. Application Oct. 6, 1930. Serial No. 486,799. 5 Claims. (Cl. 62-8.)

1. In an evaporator, means for maintaining a predetermined temperature therein which comprises a manually operated valve for controlling the rate of flow of refrigerant to the said evaporator, a second valve, a power device for opening and closing the said second valve, a thermal element positioned adjacent the suction line from said evaporator, this thermal element affecting a thermostat in control of the said power device whereby a change of temperature of the refrigerant in the suction line from the evaporator will operate the power device to open or close the valve to control admission of refrigerant to said evaporator, substantially as set forth.

1,969,104. FREEZING AND DISPENSING DEVICE. Charles R. Sibley, Marblehead, and Arthur F. Pym, Beach Bluff, Mass., assignors to Sibley-Pym Corp., Lynn, Mass., a corporation of Massachusetts. Application Dec. 30, 1931. Serial No. 583,838. 21 Claims. (Cl. 62-1.)

1. A device for freezing and dispensing flexible balls, comprising a refrigerated chamber having an inclined circuitous passage arranged to support a series of

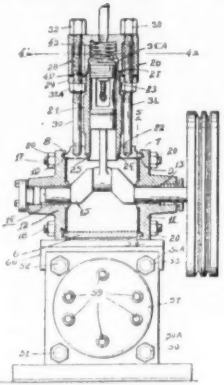
balls in position to roll through a freezing zone, and means for engaging certain spaced balls in the series to eliminate cumulative pressure on the unfrozen balls.

1,969,124. BRINE SOLUTION. William G. Finch, Greenville, Mich., assignor to Kold-Hold Mfg. Co., Lansing, Mich., a corporation of Michigan. Application Dec. 28, 1931. Serial No. 583,573. 2 Claims. (Cl. 252-5.)

1. An eutectic solution for refrigerating purposes consisting of a solution of 19 oz. of barium chloride, 18 oz. of potassium chloride, and 4 oz. of sodium chloride dissolved in 1 gal. of water.

1,969,137. COMPRESSOR UNIT CONSTRUCTION. Maxwell R. Karge, Brockport, N. Y. Application April 16, 1932. Serial No. 605,682. 7 Claims. (Cl. 230-212.)

1. In a compressor construction the combination of a crankcase having an opening therein, a cylinder having one end thereof



1,969,137

nested into said opening, a cylinder head a water jacket surrounding said cylinder head, said cylinder head with its water jacket being telescoped over the top of said cylinder, and tie bolts anchored in said crankcase and passing through said water jacket to simultaneously fasten said cylinder head to said cylinder and said cylinder to said crankcase.

1,969,151. REFRIGERATED TRUCK. Herman Flew, St. Louis, Mo. Application June 5, 1933. Serial No. 674,379. 2 Claims. (Cl. 98-2.)

2. A truck comprising a refrigerated body and a driver's compartment, a shaft journaled in the front wall of said truck above said driver's compartment, one fan secured to said shaft externally and one secured to said shaft internally relative to the front wall of said truck, said body sealed against the ingress of external air, an air confining and directing element secured to the outside of the front wall of said truck around one of said fans, said air confining and directing element having slots formed in its lateral wall and having its peripheral edges flared outwardly.

1,969,168. TUBE CUTTER. Leo Edelmann, Chicago, Ill., assignor to E. Edelmann & Co., Chicago, Ill., a corporation of Illinois. Application July 27, 1932. Serial No. 625,126. 3 Claims. (Cl. 81-192.)

1. A tube cutter comprising a supporting member provided with a tube receiving groove and having supporting bearings adjacent to and slightly spaced from said groove, a rotatable handle by which the tool is bodily swung, a cutter head mounted in said supporting bearings, a cutter carried by said cutter head to engage with a tube in said groove as the cutter head is swung, a segmental rack associated with said cutter head, and a worm cooperating with said segmental rack and rotatable with the handle to swing said cutter head.

1,969,169. METHOD OF AND APPARATUS FOR SOLIDIFYING CARBON DIOXIDE. Theophil Eichmann, Bern-Liebfeld, Switzerland, assignor to International Carbonic Engineering Co., Kennett Square, Pa., a corporation of Delaware. Application May 16, 1932. Serial No. 611,741. 5 Claims. (Cl. 62-121.)

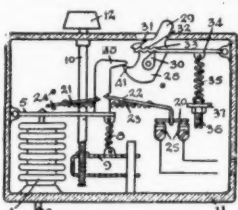
1. A press apparatus for producing blocks of solid carbon dioxide, including a press chamber, a vertically reciprocating plunger in and forming a sliding fit with the walls of said chamber, a liquid carbon dioxide expansion valve and expanding bore velocity decreasing nozzle mounted in a side wall of said chamber at the upper end thereof in proximity to but below the normal raised position of the plunger with the nozzle discharging directly into the chamber at a downward inclination, and said chamber formed with an expansion gas outlet through the side thereof in proximity to but below the normal raised position of said plunger at the upper end of the chamber.

2. A method of producing solid carbon dioxide, including the steps of expanding liquid carbon dioxide to approximately the triple point pressure to form moist snow and gases into a chamber; withdrawing the gases from the chamber and maintaining the chamber pressure during discharge and collection of the moist snow therein at a pressure to preserve the moist snow; then reducing the chamber pressure to evaporate part of the liquid in the moist snow to solidify the mixture in the chamber into a mass of substantially coherent and dense solid carbon dioxide; and applying mechanical pressures of a low order for a short period of time necessary to complete the mass in the chamber into a block of solid carbon dioxide of high density.

1,969,304. REFRIGERATOR CONTROL. Albert Oakley Grooms, Columbus, Ohio, assignor to The Automatic Reclosing Circuit Breaker Co., Columbus, Ohio. Application July 7, 1933. Serial No. 679,403. 15 Claims. (Cl. 200-83.)

1. In a thermostatic device, a switch for opening and closing an electric circuit, a heat responsive member for operating the switch in response to temperature variations, adjustable means for regulating the temperature at which the switch is opened and closed, an element including means for modifying the first named means to raise the temperature at which said switch is closed above the switch closing temperatures established by said adjustable temperature regulating means and means for modifying the first named means to lower

the temperature at which said switch is opened below the switch opening temperatures established by said adjustable regulating means, a member for operating said element for rendering either of the said modifying means operative and

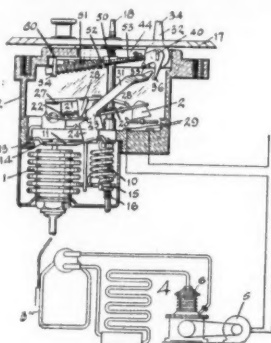


1,969,304

means whereby the modifying means rendered operative by the last named means is automatically rendered inoperative upon completion of the operation of the modifying means.

1,969,326. REFRIGERATOR TEMPERATURE CONTROL. Estel C. Raney, Columbus, Ohio, assignor to The Automatic Reclosing Circuit Breaker Co. Application Sept. 21, 1933. Serial No. 690,452. 15 Claims. (Cl. 200-83.)

1. In a thermo-responsive switch having means for opening and closing the switch, an adjusting means for adjusting the first



1,969,326

named means to produce operations of the switch at desired temperatures, a modifying means for modifying the operation of the first named means to selectively produce a predetermined lower switch operating temperature than that at which the said adjusting means is set and a predetermined higher temperature than the temperature at which the said adjusting means is set, regardless of the adjustment of the first named means by the adjusting means.

1,969,418. APPARATUS FOR QUICK FREEZING OF ARTICLES. Allen McKenzie, Chicago, Ill., assignor to Wilson & Co., Inc., Chicago, Ill., a corporation of Delaware. Application April 24, 1930. Serial No. 446,955. 4 Claims. (Cl. 62-104.)

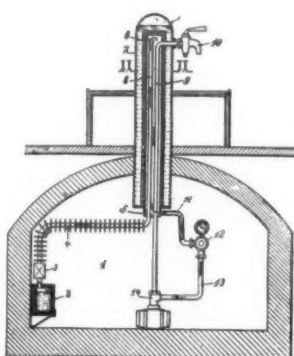
1. A container for the purpose set forth comprising a pan provided with an outwardly extending flange adjacent its upper open end, and a cover for said pan recessed at the marginal portions of its bottom and adapted to fit at its recessed portion over the flanged portion of said pan.

1,969,594. ICE DISPENSING MACHINE. Michael Dietrich, Rochester, N. Y. Application Nov. 21, 1932. Serial No. 643,637. 17 Claims. (Cl. 312-35.)

11. In a machine for dispensing ice cakes, the combination with a housing provided with a delivery opening, a shaft journaled in said housing and extending across said opening, a door for closing said opening and rotatably mounted on said shaft, and a guideway for directing ice cakes to said delivery opening, of a dog pivotally mounted and movable to a blocking position and an unblocking position with respect to said guideway, and a lever pivotally mounted on said shaft and moved by and upon opening of said door to engage and move said dog from unblocking position to blocking position.

1,969,643. BEER COOLING DISPENSING APPARATUS. Gottfried Fuchs and Hermann Spath, Stuttgart-Cannstatt, Germany. Application Dec. 30, 1932. Serial No. 649,550. In Germany March 4, 1930. 5 Claims. (Cl. 62-91.5.)

1. An automatic cooling and pressure plant, comprising in combination a cold storage room, a beer conduit leading from



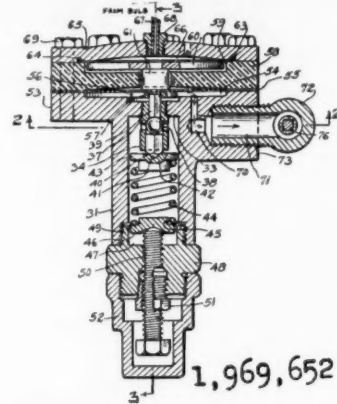
1,969,643

said cold storage room, a receptacle containing dry ice consisting of frozen carbon dioxide, means for conducting the gaseous carbon dioxide liberated by the evaporation of the dry ice in said receptacle through said room around said beer conduit and to the lower end of said beer conduit to cool said storage room and said beer conduit and supply the gaseous carbon dioxide into said beer conduit as pressure medium.

1,969,652. AUTOMATICALLY CONTROLLED REFRIGERATING SYSTEM. Lester U. Larkin, Atlanta, Ga., assignor to Larkin Refrigerating Corp., Atlanta, Ga. Application Oct. 17, 1931. Serial No. 569,505. 3 Claims. (Cl. 62-127.)

1. A refrigerant control valve, comprising a casing having two chambers adapted to contain liquid refrigerant, a valve controlling the inlet of liquid to one of said chambers from the other, a fitting detach-

ably connected to said casing to form an outlet from the first named chamber, and



1,969,652

an atomizing valve adjustable in said fitting to control the discharge of liquid from the second chamber.

1,969,703. PRODUCTION OF SOLID CARBON DIOXIDE. George D. G. Cribb and William H. Whitby, London, England, assignors to International Carbonic Engineering Co., Kennett Square, Pa., a corporation of Delaware. Application July 27, 1933. Serial No. 682,485. In Great Britain May 5, 1933. 5 Claims. (Cl. 62-121.)

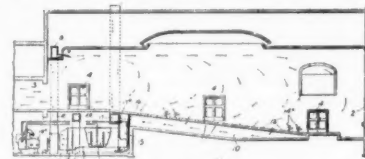
1. The method of producing a block or cake of solid carbon dioxide that includes the steps of admitting liquid carbon dioxide to the pressing chamber of a plunger press, with expansion of liquid into the chamber and discharge of gas from the chamber so regulated that the chamber becomes charged with a mixture of solid carbon dioxide and liquid carbon dioxide; then after charging the chamber with the solid and liquid carbon dioxide mixture, reducing the chamber pressure and withdrawing from the chamber the gas that is evolved by evaporation of a part of the liquid as a result of the pressure reduction; and concurrently with the chamber pressure reduction and gas withdrawal from the chamber, applying mechanical pressures to the mixture in the

press chamber at points remote from the part of the press chamber from which the gas is withdrawn.

Reissues

19,263. METHOD AND SYSTEM FOR VENTILATING AND ATTEMPERATING ENCLOSURES. Willis H. Carrier, Essex Fells, N. J., assignor to Carrier Engineering Corp., Newark, N. J. Original No. 1,775,749, dated Sept. 16, 1930. Serial No. 200,665, June 22, 1927. Application for reissue April 23, 1932. Serial No. 607,205. 28 Claims. (Cl. 98-33.)

25. The method of ventilating and air conditioning a room in which people congregate, which comprises injecting inten-



19,263

sively dehumidified air directly and unmixed with other air into the room well above the lower portion thereof and the heads of the people therein, and in a direction to avoid a direct blast of the injected air toward the people and at a velocity sufficiently high to cause an intimate mixture at a comfortable temperature of the injected air with the other air in the room and an active circulation of the mixed air toward the people at a greatly reduced velocity.

19,265. HEAT TRANSFER. Thomas Midgley, Jr., Worthington, Albert L. Henne, Columbus, and Robert R. McNary, Dayton, Ohio, assignors, by mesne assignments, to General Motors Corp., a corporation of Delaware. Original No. 1,833,847, dated Nov. 24, 1931. Serial No. 426,974, Feb. 8, 1930. Application for reissue May 28, 1934. Serial No. 728,046. 24 Claims. (Cl. 62-178.)

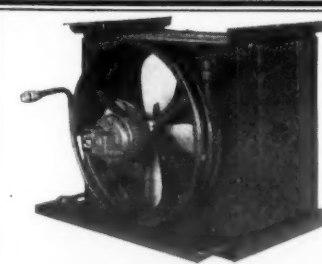
7. The process of refrigeration which comprises condensing a fluoro halo derivative of an aliphatic hydrocarbon and then evaporating the said derivative in the vicinity of a body to be cooled.

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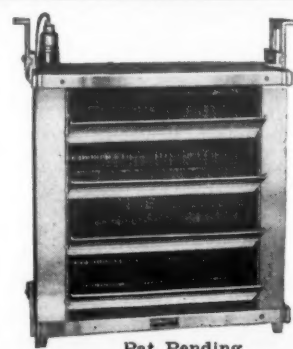
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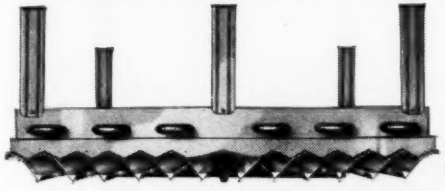
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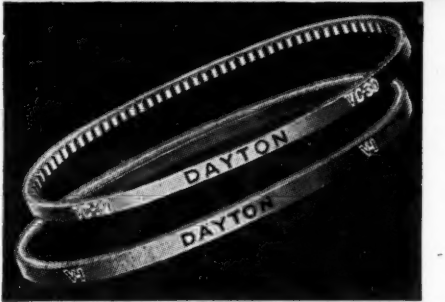
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Amer. Rad. Multiple Exp. Valve...3.50	Penn Commercial Controls \$8 & \$12.00
Apex Water Regulating Valve.....3.50	Iso Butane (Freezole) Per lb..... 1.25
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Sturdy Condensing Units from 80 to 286 Lbs. I.M.E., and all other commercial refrigeration equipment—Wall type cases with machinery—A beautiful household line of modern, conservative styles—Write for full data.

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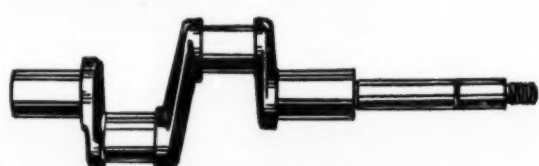
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QUESTIONS**Utilities Engineering Institute**

No. 1809 (Pennsylvania)—"Can you give me any information regarding the course in electrical refrigeration offered by the Utilities Engineering Institute of 404 N. Wells St., Chicago, Ill. A representative of the above has been after me to take the course for \$125. Before I decide, I would like to know if it is a good course, or just what kind of a reputation the institute has. I would greatly appreciate any information you could give me regarding this inquiry."

Answer: See article on Utilities Engineering Institute in June 6 issue of ELECTRIC REFRIGERATION NEWS.

Refrigeration Code

No. 1810 (Manufacturer, Illinois)—"Will you kindly send us a copy of the Refrigeration Manufacturers Code? If this code has not been agreed upon and published, can you refer us to a source of information on the fundamentals, such as wages, hours, prices, and guarantees?"

Answer: The supplemental code of fair competition for the refrigeration subdivision of the Electrical Manufacturing Industry, has been approved and the text of the code was published on page 10 of the June 13 issue of ELECTRIC REFRIGERATION NEWS. The basic Code for the Electrical Manufacturing Industry, which governs the refrigeration division, was published in the Aug. 9, 1933, issue.

Refrigerator Locks

No. 1811 (Dealer, New Jersey)—"Would you kindly give me the names of several, if possible, New York houses from which we can purchase refrigerator locks of various types?"

Answer: See page 172 of the 1934 REFRIGERATION DIRECTORY for the names of companies manufacturing refrigerator locks and other hardware. Two of the concerns listed are located in New York, as follows:
Brooklyn Hardware Mfg. Co.
41 Dobbin St., Brooklyn, N. Y.
Kason Hardware Corp.
61 Navy St., Brooklyn, N. Y.

Electric Invisible Kitchen

No. 1812 (Manufacturer, Illinois)—"In one of your recent issues, you had a news item in reference to new equipment the Electric Invisible Kitchen Co. of Chicago is manufacturing."

"We have been unable to locate them in Chicago and would appreciate information from you as to their address."

Answer: Address Electric Invisible Kitchen & Bar-ette, 1487 Merchandise Mart, Chicago, Ill.

Service Manual

No. 1813 (Distributor, Ohio)—"Mr. Ralph Widner, service man of the L. C. Ashman Co., Eaton, Ohio, is very desirous of obtaining a complete service manual on all makes of electric refrigerators."

"We are writing to ascertain if you publish such a manual and in order to facilitate matters, please address your reply direct to Mr. Widner, in care of L. C. Ashman Co., Eaton, Ohio."

Answer: Articles on servicing various makes of electric refrigeration units have been published in past issues of ELECTRIC REFRIGERATION NEWS as follows: Absopure, household, March 25, 1931; Majestic hermetic, Aug. 16, 1931; Allison, May 30 and June 6, 1934; Welsbach household, June 13, 20, and 27, 1934; Rice household, July 4, 1934; Wayne, July 11, 1934; Absopure commercial, July 18, 25, and Aug. 1, 1934; Iceberg household and water coolers, Aug. 8, 1934; U. S. Hermetic, Aug. 15, 1934; Electric refrigerators are described in this issue. This series will be continued in future issues of ELECTRIC REFRIGERATION NEWS, and we suggest that a file be kept of issues containing these articles.

Refrigeration Directory

No. 1814 (Manufacturer, California)—"We note that you publish an annual refrigeration directory. We would be pleased to know if this contains a complete list of all refrigeration manufacturers and service men, and, if so, what is the price of this directory and what is the latest current issue you have available?"

Answer: The 1934 REFRIGERATION DIRECTORY AND MARKET DATA BOOK contains the names, addresses, official personnel, and products of all manufacturers of refrigeration systems, equipment, parts, supplies, materials, and accessories.

A large number of service companies are also listed. Price of the DIRECTORY is \$3.00 per copy and the latest edition

available was published in March, 1934.

Universal Cooler Parts

No. 1815 (Distributor, Canada)—"Would you kindly advise us where we could obtain parts for Universal Cooler refrigerators? We are particularly interested in securing some of their cold controls."

"We have sold quite a number of these refrigerators in the past but through their present arrangements in Canada, we are unable to get parts we require."

Answer: T. S. Pendergast, commercial sales manager of Universal Cooler in Detroit, says replacement parts can all be obtained from the Canadian subsidiary: Universal Cooler Corp., Brantford, Ontario, Canada.

Beverage Coolers

No. 1816 (Manufacturer, Wisconsin)—"At a recent board meeting it was suggested that the writer try to get information on the number of beverage cooler manufacturers in the hope of interesting them in our high side, as we believe we have an exceptional unit for this type of cooling as it is indeed similar to the wet storage milk tank and our unit would eliminate the troublesome needle valve by the use of our patented liquid measuring device. We thank you if such a list is available and if you can furnish us with it."

Answer: Manufacturers of beverage coolers are listed in the 1934 REFRIGERATION DIRECTORY beginning on page 156. For manufacturers of milk coolers see page 240.

Air-Conditioning Coils

No. 1817 (Manufacturer, Texas)—"We intend to enter the air-conditioning equipment business and have under consideration at this time whether to attempt to manufacture our own unit or apply for the agency of some manufacturer not now represented in our territory. We expect to confine our efforts to the commercial field, and to units applicable to restaurants, drug stores, food stores, barber shops, etc., for which we believe there is a large market in this territory."

"We would appreciate receiving the names and addresses of several manufacturers of such equipment. We would also be glad to have a sample copy of ELECTRIC REFRIGERATION NEWS, and terms of subscription."

Answer: For multiple tonnage air-conditioning coils such as would be required for cooling commercial establishments such as stores and restaurants, communicate with the following manufacturers:

Baker Ice Machine Co., Omaha, Nebr.
Bush Mfg. Co., Hartford, Conn.
Carrier Engineering Corp., Newark, N. J.
Cooling & Air Conditioning Corp., Boston, Mass.
Cool-Rite Products Corp., New Haven, Conn.
Fedders Mfg. Co., Buffalo, N. Y.
Frigidaire Corp., Dayton, Ohio
General Electric Co., Chicago, Ill.
Air Conditioning Dept., New York, N. Y.
Humidi-Cooler Corp., West Haven, Conn.
Kelvinator Corp., Detroit, Mich.
McCord Radiator & Mfg. Co., Detroit, Mich.
J. H. McCormick & Co., New York, N. Y.
McQuay, Inc., Minneapolis, Minn.
Niagara Blower Co., New York, N. Y.
Peerless Ice Machine Co., Chicago, Ill.
Refrigeration Appliances, Inc., Chicago, Ill.
Reliance Refrigerating Machine Co., Inc., Chicago, Ill.
Servel Sales, Inc., Evansville, Ind.
Trane Co., LaCrosse, Wis.
Trenton Auto Radiator Works, Trenton, N. J.
Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.
York Ice Machinery Corp., York, Pa.
Young Radiator Co., Racine, Wis.

For refrigeration compressors in sizes suitable for commercial air-conditioning systems, see page 177 of the 1934 REFRIGERATION DIRECTORY.

Manufacturers of all types of complete air-conditioning systems and equipment are also listed in the DIRECTORY beginning on page 138, companies being listed according to the various functions performed by their equipment.

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GUARANTEED thermostat repair service, B and B, G. E., Cutler-Hammer, Penn. Ranco, Tag, etc. Regrind and polish float valve needles ten cents per needle, \$1.00 minimum charge. Expansion valves repaired. Gas service, Methyl, Ethyl, Sulphur, Iso-butane and others. Any amount, your cylinder or ours. Competitive prices. Halectric Laboratory, 1793 Lakeview Road, Cleveland, Ohio.

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